This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

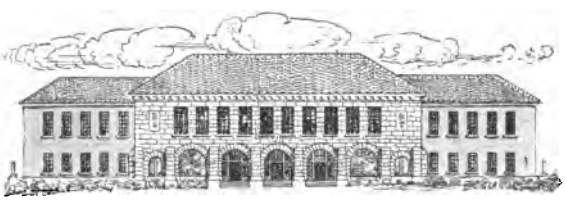
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`



SCHOOL OF EDUCATION
LIBRARY

CUBBERLEY LIBRARY

PROCEEDINGS

OF THE

TWENTY-FOURTH CONVOCATION

OF THE

University of the State of New York,

HELD JULY 6th, 7th AND 8th, 1886.

BEING A PART OF THE 100th ANNUAL REPORT OF THE REGENTS OF THE UNIVERSITY

CUBBERLEY LIBRARY

ALBANY, N. Y.:
THE ARGUS COMPANY, PRINTERS,
1887.

C

CONTENTS.

PAGE.

Sketch of the Origin, Objects and Plan of the University Convocation (reprinted from former years) 75
Minutes of the Twenty-fourth Convocation 79
Opening address, by Chancellor Pierson 79
Report of the Executive Committee, by Principal John E. Bradley 88
Appointment of committees:
On Medical Education 93
On Science Teaching in the State Museum 93
On Academic Examinations 94
Executive Committee of the Convocation for 1887 94
On Necrology 94
Closing address, by Chancellor Pierson 95
Register of the Twenty-fourth Convocation 96
Tact in Teaching, by Rev. Brother Noah 100
Remarks of Principal Joseph E. King 104
Remarks of Principal E. H. Cook 104
Industrial Education, by Superintendent S. G. Love 105
Work-shop Instruction in the College of the City of New York, by Professor Alfred G. Compton 114
Remarks of Superintendent S. G. Love 118
Remarks of Principal F. J. Cheney 120
The Present Status of Entomological Science in the United States, by Dr. J. A. Lintner 122
Has the College a Logical Place in the American System of Education? by Professor Oren Root 135
Has the College a Logical Place in the American System of Education? by Professor S. G. Williams 139
Remarks of Vice-Chancellor MacCracken 148
Remarks of Warden R. B. Fairbairn 150
Remarks of Principal E. H. Cook 151
Remarks of Inspector C. E. Hawkins 152
Remarks of Principal J. E. Bradley 153
Remarks of President W. DeW. Hyde 154
Remarks of Professor S. G. Williams 155
Remarks of Professor Oren Root 156
The Elements of Knowledge — Their Nature and Origin — A New Solution of an Old Problem, by Professor W. D. Wilson 159
The Relation of Higher Education to Religion, by President W. DeW. Hyde 183
The Natural Method of Teaching Languages 194
Remarks of C. W. Bardeen 194
Remarks of Principal F. J. Cheney 198
Remarks of Principal D. C. Farr 202
Remarks of Professor William Wells 203
The Educational Uses of Museums of Natural History, by Dr. James Hall 208
Remarks of Professor A. H. Chester 212
Remarks of Dr. N. T. Clarke 214
Remarks of Professor S. G. Williams 215
Remarks of Principal F. J. Cheney 217
Systematic Habit in Education, by Principal E. H. Cook 218
Remarks of Principal Joseph E. King 223
Remarks of Professor Oren Root 224
Remarks of Instructor A. White 225

PAGE.

Should Geometry be taught before Algebra? by Principal C. T. R. Smith.. 227
Remarks of Dr. N. T. Clarke..... 235
Remarks of Principal Adelbert Gardenier 236
Remarks of Principal C. H. Verrill 236
Remarks of Professor Oren Root 237
College Electives, by President James McCosh..... 240
The Mutual Relations of the Colleges and Academies, by Professor W. T. Hewitt..... 249
Remarks of Principal G. C. Sawyer..... 260
Remarks of Principal Joseph E. King..... 261
Remarks of Professor D. S. Martin..... 262
Remarks of Principal C. H. Verrill 263
Conference upon College Education in the State of New York:
Classical Requirements for the Degree of Bachelor of Arts, by Chancellor Charles N. Sims 265
Remarks of President E. Dodge..... 267
Remarks of Warden R. B. Fairbairn 270
Remarks of Rev. James Conway..... 274
Communication from Hobart College 275
Report of the Committee on Necrology, by Assistant Secretary Albert B. Watkins 277
Notices of:
Vice-Chancellor George W. Clinton..... 278
Rev. Augustus C. George..... 283
Dr. J. Dorman Steele..... 285
Professor Samuel Glasgow Armor 290
President Joseph Alden..... 291
Principal Frederick Norman Wright..... 293
Principal George H. Barton..... 296
Principal James Gilmour..... 299
Principal Henry Arthur Smith 301
Instructor Esmond V. De Graff..... 302

APPENDIX III.

THE UNIVERSITY CONVOCATION OF THE STATE OF NEW YORK.

I.

SKETCH OF ITS ORIGIN, OBJECTS AND PLAN.

[Reprinted from the proceedings of former years, by direction of the Convocation.]

At a meeting of the Regents of the University, held on the 9th day of January, 1863, the reports of colleges and academies, and their mutual relations, being under consideration, the following resolution was unanimously adopted:

Resolved, That it is expedient to hold annually, under the direction of this Board, a meeting of officers of colleges and academies, and that a committee be appointed to draft a programme of business for the proposed meeting, to fix the time and place, and to make such other arrangements as they may deem necessary.

The committee of arrangement on the part of the Regents were Chancellor Pruyn, Governor Seymour, Mr. Benedict, Mr. Hawley, Mr. Clinton, Mr. Perkins and Secretary Woolworth.

The meeting was held according to appointment, on the 4th and 5th days of August, 1863. Chancellor Pruyn briefly stated the objects entertained by the Regents, which were mainly "to consider the mutual relations of colleges and academies, and to promote, as largely as possible, the cause of liberal education in our State. While it is a part of the duty of the Regents of the University to visit the fourteen* literary colleges, and more than two hundred academies subject to their supervision, it is obvious that this cannot be done as frequently as desirable, and that some such method as is now proposed, whereby teachers may compare views with each other, and with the Regents, and discuss methods of instruction and general modes of procedure, is alike practicable and necessary.

"A law enacted more than three-fourths of a century ago was cited, by which the University was organized and clothed with powers similar to those held by the University of Cambridge and Oxford in England.

"The University of the State of New York, though generally regarded as a legal fiction, is in truth a grand reality. The numerous institutions of which it is composed are not, indeed, as in England,

* Now twenty-six (1886.)

crowded into a single city, but are scattered, for popular convenience, over the entire State. It is hoped that the present meeting will more fully develop this fact, in accordance with which the officers of colleges and academies now convened are cordially welcomed as members of a great State University. It is also confidently expected that the deliberations now inaugurated will result in the more intimate alliance and co-operation of the various institutions holding chartered rights under the Regents of the University.

The Chancellor and Secretary of the Regents were, on motion, duly elected presiding and recording officers of the meeting. A committee subsequently made permanent for the year and designated as the executive committee, was appointed by the Chancellor to prepare an order of proceedings. Among other recommendations of the committee, the following were submitted and unanimously adopted:

The Regents of the University of this State have called the present meeting of the officers of the colleges and academies subject to their visitation, for the purpose of mutual consultations respecting the cause of education, especially in the higher departments. It becomes a question of interest whether this convention shall assume a permanent form and meet at stated intervals, either annually, biennially or triennially. In the opinion of the committee it seems eminently desirable that the Regents and the instructors in the colleges and academies should thus meet, with reference to the attainment of the following objects:

1st. To secure a better acquaintance among those engaged in these departments of instruction, with each other and with the Regents.

2d. To secure an interchange of opinions on the best methods of instruction in both colleges and academies; and, as a consequence,

3d. To advance the standard of education throughout the State.

4th. To adopt such common rules as may seem best fitted to promote the harmonious workings of the State system of education.

5th. To consult and co-operate with the Regents in devising and executing such plans of education as the advanced state of the population may demand.

6th. To exert a direct influence upon the people and the Legislature of the State, personally and through the press, so as to secure such an appreciation of a thorough system of education, together with such pecuniary and legislative enactments, as will place the institution here represented in a position worthy of the population and resources of the State.

And for the attainment of these objects the committee recommend the adoption of the following resolutions:

Resolved, That this meeting of officers of colleges and academies be hereafter known and designated as "The University Convocation of the State of New York."

Resolved, That the members of the Convocation shall embrace,

1. The members of the Board of Regents.

2. All instructors in colleges, normal schools, academies and higher departments of public schools that are subject to the visitation of the Regents, and (by amendment of 1868) the trustees of all such institutions.

3. The president, first vice-president, and the recording and corresponding secretaries of the New York State Teachers' Association.

Resolved, That the Chancellor and Secretary of the Board of Regents shall act severally as the presiding officer and permanent secretary of the Convocation.

Resolved, That the meeting of this Convocation shall be held annually, in the city of Albany, on the first Tuesday in August [see *amendment*], at 10 o'clock, A. M., unless otherwise appointed by the Board of Regents. [*Amended*, in 1873, as to the time of meeting, by making it the first Tuesday after the Fourth of July, except when the Fourth occurs on Monday, in which case it shall be the second Tuesday thereafter.]

Resolved, That at each annual Convocation the Chancellor shall announce the appointment by the Regents, of an executive committee of seven members, who shall meet during the recess of the Convocation, at such time and place as the Regents may direct, with authority to transact business connected with its general object.

At the fourth anniversary, held August 6th, 7th and 8th, 1867, it was

Resolved, That the Regents be requested to invite the attendance of representatives of colleges of other States at future anniversaries of the Convocation.

At the fifth anniversary, held August 4th, 5th, and 6th, 1868, the following resolutions were unanimously adopted:

Resolved, That there be appointed by the Chancellor, at each annual meeting, a committee of necrology, to consist of three persons.

Resolved, That it shall be the duty of each member of the Convocation to notify the chairman of the committee of necrology of the decease of members occurring in their immediate neighborhood or circle of acquaintance, as an assistance to the preparation of their report.

Resolved, That the secretary publish, with the report of each year's proceedings, the original resolutions of 1863, as they are or may be from time to time amended, together with the two foregoing, as a means of better informing the members of the Convocation in regard to its nature and the purposes of its organization.

UNIVERSITY OF THE STATE OF NEW YORK.

An Ordinance Relative to the University Convocation.

Passed April 11, 1879.

The Regents of the University of the State of New York declare and ordain as follows.

Section 1. The University Convocation hitherto existing is hereby constituted and established as the Convocation of the University of the State of New York, and shall continue to be called and known by the style of "The University Convocation." It shall consist of such members of the Board of Regents of the University and such instructors, officers and trustees of the several colleges, academies and other seminaries subject to the visitation of the Regents and constituent members of the University, as shall at the time being attend. The purpose of the Convocation shall be to secure an interchange of opinions on the subject of education and of literature, science and art, and to advance their standard in this State; to harmonize the workings in the State system of education; and by essays, treatises, discussions and resolutions, on subjects connected with literature, science and art and with the credit, interest and welfare of the University and the institutions composing it, to recommend to such institutions and to the Regents, for their consideration, such action as may be expedient and lawful.

§ 2. The Convocation shall meet in the city of Albany, at the Capitol, on the first Tuesday after the Fourth of July, except when the Fourth occurs on Monday, in which case it shall be the second Tuesday thereafter, or at such other time and place as may be directed by the Regents. A quorum shall consist of those present at any actual sitting of the Convocation. The Board of Regents shall always be in session during the meeting of the Convocation, with such recesses of the Regents and of the Convocation as may be expedient. The Chancellor and Vice-Chancellor and the Secretaries of the Regents shall be the presiding officers and secretaries of the Convocation, with power to substitute others to perform their duties respectively, *pro tempore*, not longer than one day.

§ 3. At the time of the Convocation shall be held the annual Commencement of the University, and such degrees as may be ordered by the Regents shall be then publicly announced and conferred by the Chancellor except when the Regents shall otherwise provide.

MINUTES OF THE TWENTY-FOURTH CONVOCATION,

Held July 6–8, 1886.

ORDER OF EXERCISES.

Tuesday, July 6.— Morning Session.

The Convocation was called to order by Chancellor Henry R. Pierson. Prayer was offered by Warden R. B. Fairbairn of St. Stephen's College. Chancellor Pierson, in opening the Convocation, spoke as follows:

Chancellor Pierson's Address.

Members of the University Convocation: As the official head of the University of the State of New York, I bid you cordial welcome to this our twenty-fourth anniversary.

You will miss the presence of Dr. Murray, the distinguished Secretary of the Board, who has been compelled to seek rest by reason of impaired health; and you will mourn with me the absence of the late courteous and scholarly Vice-Chancellor, Judge Clinton, who died soon after our last Convocation. There are others, also, whose goodness and wisdom will make conspicuous their absence, and to whom appropriate reference will be made in the course of our exercises.

The executive committee, whose duty it is to prepare the programme for the Convocation, has admirably performed the task assigned to them and will announce to you, through their chairman, Dr. Bradley, the topics to be considered by the eminent persons selected to lead the discussion.

We meet to-day as the University of the State of New York, in the fullness of manly vigor, with the ripe experience of many years of faithful labor to aid us, and conscious pride at the magnificent results of our work in the field of education to stimulate us to renewed exertion. For more than a century the university has existed, and its records testify to the dignity of its purpose, the liberality of its plan, and to the distinguished men who have composed its members and officers, men whose official integrity has never been questioned. For nearly a quarter of that period this Convocation has existed.

Need I then doubt that you have heard, but with astonishment and regret, that since our last Convocation the propriety of continuing the university has been called in question?

His excellency, the Governor of the State, in his annual message to the Legislature, recommended that it and the Board of Regents be abolished, because the University of the State of New York had

no existence in fact and that the Board of Regents was a useless body.

I do not quote all that the Governor says upon the subject, but the points stated fairly present his conclusions. I have great respect for Governor Hill. His industry, his fidelity to his convictions, his positive force both in public and private life at once distinguish him as a man of mark. I cannot but believe that some evil minded or ill-advised person has misinformed the Governor as to some of the allegations in his indictment. Certainly he is in error, and I believe he would not state an error if he knew it to be such.

The University.

To prove the real existence and utility of *our* university let us consider what is a university?

It is not a college. It is not so much an institution of learning as it is the center — the representative or governor of several institutions of learning. It may be a cluster of colleges and different educational institutions, each complete in itself, both as to course of study and general regulations.

The very name university would indicate a center to which all turned — itself universal in the administration, in the union of teachers and scholars. If of historic colleges, it is the highest, the consummation and center; if of the State, the conservator of its educational system, and made to stimulate the best and highest learning; if ecclesiastical, the dispenser of all the learning in the church; if private, the broadest plant, and the most generous endowment for all teaching, in all the departments of human learning.

President Gilman of the Johns Hopkins University says: "It is the business of universities not only to perpetuate the records of culture, but to bring them out in modern, timely, and intelligible interpretation, so that all may know the laws of human progress, the dangers which imperil society, and the conditions of advancing civilization."

Cambridge University.

For illustrations, take the three distinguished universities of England — Cambridge, Oxford, and London — from which our own university may have been patterned. Let me quote for you a few thoughts and facts regarding them taken quite literally from the Cyclopædia of Education. Cambridge University is one of the oldest and most famous universities in England. It began its new era in the reign of Queen Elizabeth, under the title of the "Chancellors, Masters and Scholars of the University of Cambridge."

The university is a federal republic of seventeen colleges, or eighteen with Cavendish College. Each college has its own statutes, but is subject to university law.

The legislative and executive bodies of the university are composed of members of the colleges. The executive consists of the Chancellor, the Vice-Chancellor, the high steward, the commissary, the librarian, etc. In 1858, besides the examinations held at the college, the university held *local examinations* conducted at various places. The university is a body which holds public examinations and confers degrees, the professors lecture, but can hardly be said to teach. The university buildings are numerous, including the Senate house, adjoining which is the library, rich in four thousand manuscripts and containing half a million of volumes, the geological museum, and other museum and society buildings.

Oxford University.

Oxford University, sharing with Cambridge the pride of all England, claims to date from A. D. 872. In considering the actual state and working of this university, we must carefully distinguish between it and the colleges. The latter are corporate bodies consisting of fellows and scholars, possessing property and a building — the college proper.

The university, while technically described as consisting of the "Chancellors, Masters and Scholars," consists practically of certain fellows and heads of colleges, who fill public posts and administer public trusts. Within their own walls the members of a college are independent. The university enforces public order, offers scholarships, gives prizes, awards honors, has charge of public examinations, appoints examiners, and regulates the standard of knowledge for university degrees, which the Vice-Chancellor confers. It has twenty colleges and four halls. Of the university officers, it will be sufficient to mention the Chancellor, the High Steward, the Vice-Chancellor and the Proctor. The first was, in old times, the ruling head of the university. He was the nominee of the Bishop of Lincoln, and the guardian of his right and privileges. * * * At present he is little more than an ornamental appendage, the practical duties of his office being discharged by the Vice-Chancellor. * * * He is the resident head of the university. The university buildings are many and valuable; the Sheldonian Theater, where commencements are held and degrees conferred; the Bodleian Library, one of the largest in England; the Taylorian Institute, containing a picture gallery, etc. The revenues of colleges and university together amounts to £420,000 annually.

London University.

London University was erected by royal charter, November 28, 1836, and there is this capital difference between this university and those of Cambridge and Oxford: in the University of London, the colleges, instead of being all in one locality, are scattered over the country, some of them situated even in distant colonies, and these are called affiliated institutions. The examinations, held by

this university for the purpose of showing who is entitled to degrees, have always been of the highest order, and in 1867 a supplemental charter was obtained conveying the right to hold examinations for women.

Such is a brief description of the three great, living, successful and proudly esteemed universities of England. How do the structure, appointments, duties, responsibilities, methods, university institutions, museums, libraries, etc., etc., so far as they go, compare with our own University of the State of New York in session here, and what has been our history and the work we have accomplished?

They are the growth of centuries — we have the growth of a hundred years, beginning with the birth of the State; growing, as it has grown, with the people and from the people; always foremost in educational work; never meddling, always sustaining; and what have we accomplished?

The Board of Regents.

At the establishment of our State government we had one feeble college, Kings College, established by royal charter, October 31, 1754. Its functions were suspended during the war of Independence, and its buildings were used as a hospital. From the founding of the college till the closing of the colonial period, little was done in behalf of public education. Immediately after the revolution the number of the governors of Kings College being so lessened by death and absence as to require the interposition of the Legislature, an act was passed in 1784, investing a new incorporation under the title of the Regents of the University of the State of New York, with all the rights, franchises and privileges vested in the governors of the college by its charter, and changing the name of the college to Columbia College. This act required that all the estate, real and personal, held by King's College by virtue of its charter, should be applied *solely* to the use of Columbia College, and the same act empowered the Regents to hold additional estate for the use of said college, and for the further promotion of learning, to hold other estate, real and personal; also to found schools and colleges in any part of the State, which colleges, properly founded, should be considered as composing a part of the said university.

In the first effort to establish a university, it does not seem very strange that instead of a complete university, it revived a feeble college under a new name. No sooner was this and some other kindred errors discovered than the law establishing the University of the State was amended, and as amended, with slight changes, it still remains. The amendment was the act passed in 1787, declaring that an university be and is hereby instituted within this State, to be called and known by the name and style of the University of the State of New York. This act reduced the number of Regents, remanded Columbia College and all its estates to a board of trustees

of its own, continued the power to hold property, granted the authority to incorporate colleges, made provision for the incorporation of academies, and placed both academies and colleges under the general supervision of the Regents.

In this year and subsequent to the passage of this act the first two academies were incorporated, Clinton Academy, at East Hampton, and Erasmus Hall at Flatbush.

In 1793 the Regents, in their report, recommended the establishment of a general system of common schools.

In 1797, Governor George Clinton, who was also at that time the first Chancellor of the University, in his message to the Legislature, urged the establishment of common schools throughout the State, and on the ninth of April in the same year a law was passed for the purpose of encouraging and maintaining such schools.

It was also due to the repeated appeals of the Regents of the University that the importance of encouraging literature by the aid of State funds was impressed upon the Legislature and the foundation of the liberal policy of this State toward education was begun. To enable the Regents to distribute the funds intrusted to their care to those only who were entitled to them, they were empowered to require returns of the qualification of pupils to be made annually to their secretary under oath of the principal or one of the trustees of the school. In the year 1866 a committee of the Regents reported through their chairman, Lieutenant Governor Alvord, that so long as the power of determining the qualifications of pupils entitled to share in this distribution was intrusted to the *principals or local authorities*, no uniform standard of scholarship could prevail, and scholars would be claimed in one academy whom a higher standard would exclude in another.

In accordance with the suggestions of this valuable report, in 1866, a system of examination was established by means of printed questions, prepared at the office of the Regents and used at all the schools *simultaneously*. To make a still more efficient basis for distribution since 1870, the answer papers of the pupils have been required to be sent to the office of the Regents, where, after careful review, the successful candidate is awarded a certificate of academic scholarship, and the school is entitled to draw a *pro rata* share from the literature fund in accordance with the ordinances of the Regents. This system, known as the preliminary academic examination, has become so valuable to the schools as a test of uniform scholarship and proficiency on the part of the teacher as well as pupil, that its real purpose as a basis of distribution of State money has become of secondary importance.

Higher Examinations.

Section 6, chapter 435 of Laws of 1877, authorized the Regents to establish higher examinations.

The first part of the section is *mandatory* and enjoins upon the Regents the establishment of examinations in the academies and

academic departments of union schools, that will furnish a suitable standard of graduation from said academies and academic departments. The second part of the section is *permissive* and authorizes the Regents to establish examinations and to confer upon successful candidates such degrees as the Regents may deem expedient.

Under this statute, as enjoined by the first part of section 6, the Regents instituted and put in operation at once, a system of examinations in the academies and academical departments of union schools, making a standard suitable for graduation therein.

The work already done under the mandatory obligation of the law of 1877 has been very great, with the preliminary examination far exceeding any other department of work the Regents perform, and its importance to the cause of education cannot be easily over estimated.

Under its stimulating influence the advance in educational work in the academies has been marked. The statistics of the last report of this Board show that there are under the charge of the Regents of the University 283 academies and academic departments of union schools, and of these 134 have been visited by the Board or its officers during the past year.

This report shows that in the years 1884–85, 72,420 answer-papers on the forty different subjects of the preliminary and advanced examinations were received and passed upon at this office. This is no perfunctory service. Each paper is critically reviewed with a conscientious endeavor to determine its real worth, requiring the assistance of many skillful and experienced persons. The total number of papers received in the years 1879–80, in the advanced branches alone was 7,515, while in the years 1884–85, it was 34,276, or nearly five times increased in as many years. The methods of preparing those papers, their distribution, the arrangement and examination after their return from the academies and academical departments, involving an immense amount of labor systematized and accomplished by a carefully organized department, invite the examination and consideration of every lover of learning in the State, and are the pride and promise of the University of the State.

In 1878 a committee was appointed by the Regents to devise a plan for the examinations provided for in the second part of that section of the act. The committee, of which Professor W. D. Wilson, of Cornell University, was chairman, reported to the Regents at their annual meeting in January, 1880, a plan which embraced post-graduate courses of study, the successful completion of which would entitle the candidate to the degree of Master of Arts, or Doctor of Philosophy.

This plan is still under consideration by the Board and its officers, but the continued and astonishing growth of the academic examinations has precluded the possibility of performing so important a

trust with the means at our command, and the Regents have thus far been unwilling to ask the requisite appropriation.

Teachers' Classes.

Another great work promoted and carried into successful execution by the Regents of the University is that of supplying common schools with competent teachers, trained in the academies under our charge, with special reference to the duties they will be expected to perform.

In 1855 the Legislature provided for an annual appropriation of $30,000 for instruction in academies and union schools of classes in the science and practice of common school teaching.

It is made by law the duty of the Regents to designate the academies and union schools in which instruction shall be given, and they are carefully discharging that obligation.

The report of the Regents for the years 1884 and 1885 shows that teachers' classes were organized in 145 schools, with 2,348 pupils. The classes have the benefit of an instructor and inspector, selected and appointed by the Regents, who has special qualifications to instruct in the art of teaching, the best methods of imparting knowledge and promoting the best interests of our common schools.

The work is very well done and has the co-operation of the Superintendent of Public Instruction and the county common school commissioners.

If the number of teachers annually instructed, between two and three thousand, is considered, and the fact that this instruction is specific and systematic in its purpose and methods, the good done will be better appreciated.

Testimonials of qualification are issued to those who have proven their ability by a faithful apprenticeship, and the results have shown the system to be one of the most efficient factors in the State educational system.

The Growth of Colleges.

The 100 years that have elapsed since the establishment of the university have been signalized throughout by such evidences of the wisdom and prudence of its Regents in behalf of educational advancement, that now from the one feeble college placed under its charge when incorporated, the statistics of colleges in the Regents' report of January last show that there were subject to their visitation during the year 1884–85, 45 institutions with 785 instructors, 11,702 students and 1,571 graduates. The total value of college property was $23,164,602.83, and the yearly expenditure $1,787,391.51.

The same report shows that most of these colleges were visited by the Regents or their officers during the year.

I may also add that during the past year several important changes in the administration of our colleges have occurred, and

many magnificent donations testify to the continued and generous devotion of our people to education. The presidency of Cornell University, made vacant by the retirement of that ripe scholar and earnest worker, Hon. Andrew D. White, has been filled by the election of Dr. Charles K. Adams, of Michigan University. The university has, after prolonged litigation in the Surrogate's Court, received a favorable decision in the matter of the Fiske will by which it was granted property valued at about $1,500,000. Vassar College has conferred its presidency on Dr. James M. Taylor, of Providence. Union College has acquired possession of $20,000, bequeathed by the late James Brown, Esq., of New York city, to Mrs. Nott, during her lifetime, with remainder to the college. The trustees have not yet permanently filled the presidency of the college, but the interests of the institution are ably cared for by the acting president, Judge Landon. We have to chronicle a serious loss to Hobart College in the destruction by fire of its valuable library, but, through the energy of President Potter and the friends of Hobart, provision has been made for its replacement and for further additions to the college. The Vanderbilt family has supplemented the princely generosity of their father by a gift of $250,000 to the College of Physicians and Surgeons of the city of New York. This sum is intended to erect and maintain a building to be called "The Vanderbilt Clinic."

The Faculty of Medicine of the University of the city of New York have received through Dr. Loomis, from a donor whose name is known only to him, the generous sum of $100,000. Plans for enlargement of their building and increased facilities have already been begun.

There are doubtless many other items worthy of announcement at this time, but I have given such as have come to my notice in advance of the receipt of the annual reports for the past collegiate year.

THE UNIVERSITY CONVOCATION.

These Convocations have lasted for nearly a quarter of a century, with an unbroken record and an increasing interest.

I venture to say that no more useful or interesting record of any educational body, certainly in this State, if in any other, can be found. These Convocations have been conducted with the utmost care, with the wisest council, and the most careful selection of topics, and their proceedings are sought for everywhere, by teachers and scholars.

Again, read the record of the proceedings of those Convocations, and I venture to say, that no such collection of papers upon the subject of higher education can be found. Their record is our just pride, and will be preserved in the archives of the State when we who live shall have been forgotten. Are we to consider this Convocation of the University a useless appendage, when there were present at our last session eight college presidents, and thirty-two

professors, sixty-six principals of schools of academic grade and twenty-four instructors, five normal school principals and eight instructors therein, thirteen superintendents or commissioners, and thirty-one others interested in educational work — in all 187 active and distinguished workers who have no incentive to call them here but their earnest desire to give and receive what aid they can toward promoting the educational interests of the State?

Degrees.

It is true, the university has not conferred many degrees, because that was a concurrent power with the colleges, and it has been thought wise by the Regents to leave the exercise of that function mainly to the colleges. Should we be able to establish the post-graduate course, to which I have already made reference, then the university will hold examinations and confer degrees without in any way encroaching on the prerogatives of the colleges.

By this brief statement of the history of the University of the State of New York, I think I have proved, in its past and present, that the university was legally and fairly established as the first educational body of this State, and the duties of the Regents, which were carefully defined, have been frequently increased and have been well performed. The University of the State of New York has had a real existence, has done active work, and has performed all the services usually belonging to universities in this or any other country during the period of its existence. The corporate name of the board is not a deception and should not mislead, and the Board of Regents have done and are doing too valuable a service in the cause of State education to be abolished or consolidated with any other department.

And yet his Excellency the Governor says:

"I think there is no necessity for the official existence of the Board of Regents. Its corporate name is deceptive and misleading. Its powers and duties can be intrusted to other and appropriate hands without detriment to the public interests, thereby saving to the State the annual expense of its maintenance and dispensing with the anomaly of a two-headed educational system and the confusion of a divided and sometimes conflicting superintendence in the same public schools."

There is no two-headed educational system, for each system is entirely distinct in plan and purpose, as it is in organization, there is not and never has been any confusion, nor has there been any conflict; on the contrary, there has been the utmost harmony.

But, gentlemen of the Convocation, I am not here to personally defend the members of the Board of Regents: I have given you something of their work and their history. They began when the State began; they have grown with the growth of the Commonwealth. No institution of the State has been more stable in its character, more carefully confined to its legitimate and primitive functions,

and no more honorable list of names can be found than these Regents of the University, who have performed a gratuitous and most valuable service. I point to those who have gone before, and to those of my present associates with great personal pride. For myself I claim nothing, at best my work is nearly done; it has been a pleasant and dignified and most honorable duty; it has given me delightful companionship, and some good opportunities to do the State some service. It has been made very pleasant and void of vexations, because the Board has no pay, no politics, no patronage. I am ready to retire, but I pray I may never see so pure and so clean an institution, that has lived a century without a fleck or a stain, now thrown into the dirty water of party politics.

Gentlemen — I thank you for your patience. I felt it my duty to be thus explicit. I have no malice; no feeling but to improve this opportunity of declaring my sentiments on so important a subject, as it may be my last meeting with you. I have prepared this paper amid much suffering and weakness, and I feel that I am entitled to your indulgence.

Finally, I cannot close my remarks in anyway so appropriately as by quoting from a recently published and admirable State paper by Governor Hill, in which he says: "All change is not reform. Unless a change is based upon some sound principle, and is capable of some practical good result, it ought not to be entered upon."

REPORT OF THE EXECUTIVE COMMITTEE.

The Executive Committee have noted with pleasure the rapidly increasing attendance upon the meetings of the Convocation. This body possesses more of a distinctively representative or delegate character than other organizations of educators and is more nearly homogeneous. Only two grades of instruction are here considered, the collegiate and the academic, and these are so closely allied and interdependent that it is possible, without dividing the interest by meeting in sections, to discuss subjects of general and practical importance. That much good has been accomplished by these annual reunions and discussions is now apparent. Old prejudices have been removed and new points of sympathy and co-operation have been established.

It is difficult to realize the remarkable progress that has been made in higher education in this State during the twenty-four years since the birth of the Convocation. The number of colleges has increased from thirteen to twenty-six and the number of students in attendance upon them — including also the professional schools — has risen from 2,068 to 11,712. Then there were two normal schools, now there are nine. When the faculties and officers of educational institutions were invited to assemble for the first University Convocation six high schools or free academies ministered to the educational needs of this State, now their

number has increased to two hundred, with plenty more to follow as soon as the Regents can find time to receive them into the select circle of their official family. About twenty years ago a distinguished professor in a New York college stated in a public address that no school could be found outside of New York and Brooklyn, throughout the length and breadth of this State, where a boy could obtain a respectable preparation for college. We may be sure that no such statement is likely to be made at the present time, and your committee venture to suggest that, if this growth of our colleges continues, their representatives may take courage and cease to lament that the youth of New York are educated in New England institutions. And may we not hope that the time is drawing near when we shall educate our own teachers and when the representatives of our high schools and academies will not too readily concede the inferiority of *our* secondary education to the excellent systems to be found both east and west of us.

How largely the Convocation has been instrumental in this remarkable progress, it is scarcely necessary to indicate. It was at one of its first meetings that the plan of preliminary examinations was devised which swept away the pernicious delusion that children who could scarcely read and write were "academic scholars;" and it was from the zeal and enthusiasm generated here that the statute of 1877 was born, which gave to the State a more complete and symmetrical system of educational tests than can be found elsewhere in the world, except in France and Germany. It is the testimony of those most competent to judge, and abundantly confirmed by statistics, that the effect of these examinations has been to prevent pupils from dropping important studies before they have gained a proper mastery of them; to arouse their youthful ambition; to form their standards of excellence and teach them the great life-lessons of thoroughness and perseverance. Especially has the Convocation been the means of cultivating friendship and good will among the representatives of the academies and colleges of the State, inspiring teachers and officers with new motives and making improved methods of instruction and discipline a common possession.

We welcome our brethren and associates in educational work to this twenty-fourth annual Convocation, confident that the exercises arranged for their enjoyment cannot disappoint them. Not only have your committee been able to draw freely upon the best talent in our own State, but men of great eminence from other States have cordially accepted invitations to address this audience. The bond of fraternity among those who labor in the same cause is thus more firmly cemented, and we heartily welcome to our fellowship the distinguished presidents of Bowdoin and Princeton, and all other representatives of the educational interests of other States.

Your committee have endeavored so to arrange the order of exercises as to give ample time for the interchange of views, and they cordially invite a free and prompt discussion of all topics of interest embraced in the programme.

Respectfully submitted in behalf of the executive committee.

JOHN E. BRADLEY,
Chairman.

The first paper was read by the Rev. Brother Noah, Professor of English Literature in Manhattan College, upon "Tact in Teaching," and was followed by a discussion in which Principal Joseph E. King, of the Fort Edward Collegiate Institute, Principal E. H. Cook, of the Potsdam Normal School, and Superintendent David Beattie, of Troy, took part.

Superintendent Samuel G. Love, of Jamestown, read a paper upon "Manual Training," which was followed by an interesting discussion in which Professor Alfred G. Compton, of the College of the City of New York, Superintendent David Beattie, of Troy, Superintendent Samuel G. Love, of Jamestown, Principal Francis J. Cheney, of the Kingston Free Academy, Superintendent A. J. Robb, of Cohoes and Principal J. W. Cole, of Troy, participated.

Dr. J. A. Lintner, State Entomologist, then read a paper upon "The present status of entomological science in the United States."

By invitation of the Chancellor, Regent Watson presided during the reading of Dr. Lintner's paper.

AFTERNOON SESSION.

In the absence of the Chancellor, Regent Watson presided.

Prof. Oren Root, of Hamilton College, read a paper upon the question, "Has the College a logical place in the American System of Education?" And was followed by Professor S. G. Williams, of Cornell University, with a paper upon the same topic. The discussion was opened by Vice-Chancellor Henry A. MacCracken of the University of the city of New York, followed by Warden R. B. Fairbairn of St. Stephen's College, Principal E. H. Cook of the Potsdam Normal School, Inspector Charles E. Hawkins of the Regents' office, Principal John E. Bradley of the Albany High School, President William DeW. Hyde of Bowdoin College, Professor S. G. Williams and Professor Oren Root.

EVENING SESSION.

Chancellor Pierson presided.

An address was given by President William De W. Hyde, of Bowdoin College, upon "The Relation of the Higher Education to Religion." At the close of the address Principal E. H. Cook, of the Potsdam Normal school, introduced a resolution offering a vote

of thanks to President Hyde for his admirable, eloquent and instructive address. The resolution was unanimously adopted.

Professor William D. Wilson, of Cornell University, then read a paper upon "The Elements of Knowledge."

Wednesday, July 7.— Morning Session.

Chancellor Pierson was in the chair.

President L. Sauveur, of the College of Languages, New York city, who was expected to read a paper upon "The 'Natural Method' of Teaching Languages" was not present, having sent to the executive committee a letter of excuse.

Mr. C. W. Bardeen, editor of the School Bulletin, kindly consented to present an outline of the "Natural Method of Teaching Languages," as he understood it, as a basis for discussion. He was followed by Principal George C. Sawyer, of the Utica Free Academy, in a paper, and by Principal Francis J. Cheney, of the Kingston Free Academy, Principal Daniel C. Farr, of the Glens Falls Academy, and Professor William Wells, of Union College, in a discussion upon the same subject.

Professor James Hall, State Geologist, presented a paper upon "The Educational Uses of Museums of Natural History." Professor Albert H. Chester, of Hamilton College, opened the discussion upon the paper. Principal John E. Bradley, of the Albany High School, offered the following resolution, which was seconded by Dr. Noah T. Clarke, of Canandaigua, and unanimously adopted:

Resolved, That the thanks of the Convocation be extended to Professor Hall, Director of the State Museum of Natural History, and to the Regents of the University, for their generous and patriotic effort to provide the schools of the State with valuable and reliable collections for the illustration of the various departments of natural history.

The discussion was continued by Professor S. G. Williams, of Cornell University; Principal Francis J. Cheney, of the Kingston Free Academy, and Chancellor Pierson.

Assistant Secretary Albert B. Watkins, chairman of the Committee on Necrology, presented the report of the committee. A memorial notice of Principal Fred. N. Wright was read by Principal George R. Cutting, of the Auburn High School, and one of ex-President Joseph Alden was read by the assistant secretary.

Afternoon Session.

Chancellor Pierson occupied the chair, and before announcing the reading of the first paper extended to the members of the Convocation, on behalf of Hon. Andrew S. Draper, State Superintendent of Public Instruction, an invitation to visit the rooms of the Department of Public Instruction on Thursday morning at nine o'clock.

Principal E. H. Cook, of the Potsdam Normal School, read a paper upon "Systematic Habit in Education." The discussion was opened by Principal Joseph E. King, of Fort Edward Collegiate Institute, followed by Professor Oren Root, of Hamilton College, Instructor Aaron White, of Cazenovia Seminary, and Principal Arthur H. Flack, of the Claverack College and Hudson River Institute.

Principal Charles T. R. Smith, of Lansingburgh Academy, then read a paper upon "Should Geometry be taught before Algebra?" An animated discussion followed in which Dr. Noah T. Clarke, of Canandaigua, Principal Adelbert Gardenier, of the Stamford Seminary and Union Free School, Principal Charles H. Verrill, of the Delaware Literary Institute, and Professor Oren Root, of Hamilton College participated. Upon motion of Principal John E. Bradley, the paper was referred to the committee on the Regents' examinations for their consideration.

Before closing the session, Chancellor Pierson referred to his bereavement in his family and his own illness as reasons for finding it inconvenient to entertain the members of the Convocation at his own residence, and announced that he would be pleased to receive the members of the Convocation in the Regents' rooms at the close of the evening session and present them to President McCosh.

EVENING SESSION.

Chancellor Pierson in the chair.

The evening session was occupied by an address by President James McCosh, of the College of New Jersey, at Princeton, upon "Elective Studies in College." Upon motion of Principal John E. Bradley, of the Albany High School, a vote of thanks to President McCosh for the honor he conferred upon the Convocation and for his address, was unanimously carried. At the close of the session the members of the Convocation repaired to the Regents' rooms and were presented to President McCosh by the Chancellor.

THURSDAY, JULY 8.— MORNING SESSION.

Chancellor Pierson presided.

Regent Watson, Chairman of the Committee on Medical Education and Licensure, presented the following report, signed by himself, Warden R. B. Fairbairn, and Vice-Chancellor Henry M. McCracken:

The committee appointed at the last Convocation to continue the consideration of the subject of medical education and licensure, beg leave to report that there are evidences of a growing sentiment on the part of the medical profession in favor of placing the control and regulation of medical licensure under State authority, several papers and addresses having been presented and read at

medical meetings held in this State, in which the establishment of State boards of medical examiners has been indorsed and strongly recommended. While progress is being made, the movement has not yet reached a degree of development requiring specific action on the part of this body. These facts are therefore presented for the consideration of the Convocation, coupled with the suggestion that the subject is one of sufficient importance to warrant the continuance of a committee of observation.

Chancellor Sims, of Syracuse, spoke in favor of instituting a change in the present method of obtaining a license to practice medicine. He thought instructors ought not to license students to practice. Neither ministers or lawyers are admitted to preach or practice by their teachers. An entrance into these professions is protected by proper safe-guards, which are not applied to medical students; yet no good reasons are apparent why an exception should be made in favor of the latter class. He hoped the Convocation would indorse the principle of establishing tests of acquirements on the part of medical students, by bodies other than their instructors, and with this object in view he offered the following resolution, which was adopted:

Resolved, That in the judgment of this Convocation, the power to license physicians should be vested in boards of examination different from faculties of medical instruction.

Standing Committee on Medical Education.

The following resolution, offered by Principal Sawyer, was adopted:

Resolved, That the following gentlemen, viz.: Regent Wm. H. Watson, M. D., chairman; Chancellor Charles N. Sims, LL. D., Warden R. B. Fairbairn, D. D., Vice-Chancellor Henry M. MacCracken, D. D., and Truman J. Backus, LL. D., be constituted a standing committee of the Convocation on medical education and medical licensure.

Principal J. E. King, chairman of the Committee on Science Teaching in the State Museum, said that the report of the committee was not ready to be presented, and asked to have the committee continued. The committee, consisting of Principal Joseph E. King, Fort Edward Collegiate Institute; Professor Daniel S. Martin, Rutgers Female College; Instructor Walter A. Brownell, Syracuse High School, was continued.

Principal D. C. Farr offered a resolution, which was adopted, that the Regents be respectfully requested to reappoint Dr. John E. Bradley as chairman of the Executive Committee for the Convocation of 1887.

Chancellor C. N. Sims, who was unable to be present when the report of the committee of Necrology was made, read a memorial notice of Dr. J. Dorman Steele. The following resolution was

offered by Principal George R. Cutting, of the Auburn High School, seconded by Dr. Noah T. Clarke, of Canandaigua, and was unanimously adopted:

Resolved, That the thanks of this Convocation be extended to Chancellor C. N. Sims for his accurate and inspiriting sketch of the remarkable career of our late associate, Dr. J. Dorman Steele; and that, coupled with this expression, we likewise place on record our testimony to the great esteem in which Dr. Steele was held by the teachers of the State of New York.

Professor W. T. Hewett, of Cornell University, read a paper on "The Mutual Relations of the Colleges and the Academies."

An interesting discussion followed, in which Principals G. C. Sawyer, D. C. Farr, J. E. King, Professsr D. L. Martin, Principal C. H. Verrill and Chancellor Pierson participated.

The remainder of the morning session was occupied by the conference of the college presidents. Chancellor Charles N. Sims, of Syracuse University, presided, and opened the discussion upon "Classical Requirements for the Degree of A. B." He was followed by President Ebenezer Dodge, of Madison University; Warden R. B. Fairbairn, of St. Stephen's College; President James McCosh, of the College of New Jersey; and Rev. Brother James Conway, of Canisius College. President E. N. Potter, of Hobart College, was unable to be present, but sent a communication embodying the views of the faculty of Hobart College upon the question, which was read by Professor Oren Root.

Principal John E. Bradley offered the following resolution, which was seconded by Chancellor Pierson, and unamiously adopted:

Resolved, That the prolonged and painful illness of Dr. David Murray, the efficient Secretary of the Board of Regents, causes the deepest regret, and the members of the Convocation cordially express their sincerest sympathy with him and his family, and their earnest hope for his speedy and complete recovery.

Chancellor Pierson then named the following committees:

On Necrology.— Assistant Secretary Albert B. Watkins, office of the Regents; Professor Edward North, Hamilton College; Professor Daniel S. Martin, Rutgers Female College.

On Academic Examinations. — Professor William D. Wilson, Cornell University; Principal John E. Bradley, Albany High School; Principal George C. Sawyer, Utica Free Academy; Principal Daniel C. Farr, Glens Falls Academy; Principal Francis J. Cheney, Kingston Free Academy; Principal John G. Wight, Cooperstown Union School; Principal Frederick E. Partington, Staten Island Academy.

Executive Committee for Convocation of 1887.—Principal John E. Bradley, Albany High School; Professor Oren Root, Hamilton

College; Rt. Rev. Stephen Vincent Ryan, Chancellorof Niagara University; Principal Eugene Bouton, New Paltz Normal School; Principal George A. Bacon, Syracuse High School; Principal George C. Sawyer, Utica Free Academy; Principal Charles T. R. Smith, Lansinburgh Academy.

Chancellor Pierson, in closing the Convocation spoke as follows:

Gentlemen of the Convocation. — In closing the Convocation there is no special need that I should say anything in addition to what I have already said, but as the years go by, as I meet with this Convocation, and as I hear the remarks of the men that come here and look into their faces, of men who do not expect anything, as I see the interest and the intelligence, and as I feel that the work done here is really a substantial work in the interest of education, I feel not only proud of the position, but I feel an interest in you that I have not words to express; a sort of fellowship, a kind of magnetism, in the interest of education, in the promotion of the good of my fellow man, in making manhood, in creating intellect, in giving culture that will enable a man to stand up here and elsewhere and feel himself a full grown man, and express his convictions in a clear and intelligible way. I think of this Convocation that it is a wonderful work. I was glad to hear Dr. McCosh say that he hoped that it would not be abolished. I pray it may not be abolished, and the University not abolished and the Regents not abolished. I do not say it because I am a Regent and a Chancellor. It does not make one feather's weight to me. I can work just as well as a layman, as here, and while I have health and strength, I pledge myself to our work. Regent or Chancellor or member of the Convocation, I will do what I can to promote education and the good of my fellow man in that direction.

Gentlemen, I thank you for your attendance and patient attention. I have missed Dr. Murray. You have missed him. I have missed a good many of the elements of the Convocation, but I have done the very best I could and I thank you heartily.

Chancellor Charles N. Sims then pronounced the benediction and the Convocation was declared adjourned.

REGISTER OF THE TWENTY-FOURTH CONVOCATION.

Permanent Officers, Ex-officio.

Henry R. Pierson, Chancellor.
George William Curtis, Vice-Chancellor.
David Murray, Secretary.
Albert B. Watkins, Assistant Secretary.

Executive Committee of the Convocation for 1886.

Principal John E. Bradley, Albany High School, Chairman.
Vice-Chancellor Henry A. MacCracken, University of City of New York.
Professor Oren Root, Hamilton College.
Principal E. H. Cook, Potsdam Normal School.
Principal A. C. Hill, Cook Academy.
Principal J. P. McIncrow, St. Mary's Catholic Institute.
Principal H. P. Emerson, Buffalo High School.

Committee on Necrology.

Assistant Secretary Albert B. Watkins, office of Regents.
Professor Edward North, Hamilton College.
Professor Daniel S. Martin, Rutgers Female College.

Registered Members of the Convocation.

Board of Regents.

Henry R. Pierson, Chancellor, Albany.
E. W. Leavenworth, Syracuse.
William L. Bostwick, Ithaca.
O. H. Warren, Syracuse.
William H. Watson, Utica.
Hamilton Harris, Albany.
Daniel Beach, Watkins.
Willard A. Cobb, Lockport.
Albert B. Watkins, Assistant Secretary.
Charles E. Hawkins, Inspector of Teachers' Classes.
Edward J. Devlin, Chief Clerk.
William B. Gracie, Clerk.
Jesse M. Watkins, Clerk.

Colleges.

Columbia College — Professor Nicholas Murray Butler.
Union College — President J. S. Landon, Professor William Wells, Professor Maurice Perkins.
Albany Medical College — Dr. Albert Van der Veer, Dr. S. R. Morrow, Dr. F. C. Curtis.

Hamilton College — Professor Oren Root, Professor F. W. Burdick, Professor Albert H. Chester, Professor George P. Bristol.

University of the City of New York — Vice-Chancellor Henry M. MacCracken.

Madison University — President E. Dodge, Professor N. L. Andrews, Professor P. B. Spear.

St. Stephen's College — Warden R. B. Fairbairn, Professor William W. Olssen.

Manhattan College — Brother Noah.

Vassar College — Trustee Henry M. King.

Cornell University — Professor W. D. Wilson, Professor S. G. Williams, Professor W. T. Hewitt, Instructor Charles B. Wilson.

Rutgers Female College — Professor Daniel S. Martin.

Syracuse University — Chancellor C. N. Sims.

St. Bonaventure's College — Rev. Joseph Butler.

Niagara University — Vice-President Rev. M. J. Kircher.

Canisius College — Rev. J. Conway, Rev. Martin Bischoff.

Department of Public Instruction — Deputy Charles R. Skinner, Institute Instructor Henry R. Sanford.

Albany Normal School — President E. P. Waterbury, Professor Wm. V. Jones, Miss Mary A. McClelland, Miss Kate Stoneman, Miss Josephine E. Seaman.

Potsdam Normal School — Principal E. H. Cook, Professor F. L. Dewey.

New Paltz Normal School — Principal Eugene Bouton.

State Library — Librarians S. B. Griswold, George R. Howell.

State Museum — Director James Hall, Professor John C. Smock, Charles E. Beecher, John Clarke, State Entomologist J. A. Lintner.

State Civil Service Commission — Chief Examiner James E. Morrison.

Academies.

Adams Collegiate Institute — Principal Orlo B. Rhodes.

Addison Union School — Principal James A. Estee.

Albany Academy — Principal James M. Cassety, Instructor Charles B. Goold, Instructor George Babcock, Instructor Ralph M. Thomas.

Albany High School — Principal John E. Bradley, Instructors O. D. Robinson, E. A. Corbin, W. D. Goewey, Miss Mary I. Davis, Miss Mary N. Zeitler, Miss Annie M. Halpen, Mrs. Margaret S. Mooney.

Albany Female Academy — Miss Elizabeth M. Millard.

Albany Public Schools — Principals Thomas S. O'Brien, J. L. Bothwell, J. H. Gilbert, Miss Emma Le Boeuf, Miss Hetty S. Haywood, Miss Jennie A. Utter, Miss Maggie A. Hevenor.

Amsterdam Academy — Principal Charles Van T. Smith.

Auburn High School — Principal George R. Cutting.

Cambridge Union School — Principal Nathan G. Kingsley.

Baldwinsville Union School — Miss Mary Trumbull.

Canajoharie Union School — Principal Charles F. Wheelock.
Canandaigua Academy — Ex-Principal Noah T. Clarke.
Canaseraga Union School — Principal M. L. Spooner.
Canisteo Academy — Principal D. M. Estee.
Catskill Free Academy — Miss Emma W. Crain.
Cazenovia Seminary — Instructor Aaron White.
Chatham Union School — Principal I. P. Bishop, Miss Ella E. Wagar, Miss Flora J. Bassett.
Claverack Academy and H. R. Institute — Principal Arthur H. Flack.
Cook Academy — Principal A. C. Hill.
Cooperstown Union School — Principal John G. Wight.
Coxsackie Union School — Principal John H. Kelley.
Delaware Literary Institute — Principal Charles H. Verrill.
Egberts High School — Superintendent A. J. Robb.
Flushing High School — Principal S. J. Pardee, Mrs. S. J. Pardee.
Fort Edward Collegiate Institute — Principal Joseph E. King.
Genesee Valley Seminary — Principal Thomas C. Miller.
Glens Falls Academy — Principal Daniel C. Farr, Miss Francis A. Tefft.
Greene Union School — Principal Welland Hendrick.
Hornell Free Academy — Principal Robert Simpson, Jr.
Houghton Seminary — Principal A. G. Benedict, Miss A. C. Herrick.
Hudson Academy — Principal J. M. Frost.
Hudson High School — Principal P. F. Marshall.
Jamestown Union School — Principal Samuel G. Love.
Jordan Academy — Principal J. W. Chandler.
Kingston Free Academy — Principal Francis J. Cheney.
Keeseville Union School — Principal A. C. Ferrin.
Lansingburgh Academy — Principal C. T. R. Smith.
Marion Collegiate Institute — Principal F. W. Colegrove.
Mechanicville Academy — Principal Mrs. S. E. K. Ames.
Munro Collegiate Institute — Principal T. K. Wright.
Oneonta Union School — Principal N. N. Bull.
Owego Free Academy — Principal E. J. Peck.
Palatine Bridge Union School — Principal C. N. Cobb.
Port Jervis Union School — Principal John M. Dolph.
St. Mary's Catholic Institute — Rev. J. P. McIncrow, Principal F. J. Cummings.
Schenevus Union School — Principal Floyd L. Lowell.
Schoharie Union School — Principal Solomon Sias.
Seymour Smith Academy — Principal Abraham Mattice, Miss M. Luella Mattice.
Sodus Academy — Principal Elisha Curtiss.
Stamford Academy — Principal Adelbert Gardenier.
Syracuse High School — Principal George A. Bacon.
Temple Grove Seminary — Principal Charles F. Dowd.

Ten Broeck Free Academy — Principal T. F. Chapin.
Troy Academy — Principal T. Newton Wilson.
Troy Public Schools — Superintendent David Beattie; Principal J. W. Cole.
Troy Female Seminary — Miss Mary A. Green.
Ulster Academy — Principal W. E. Bunten.
Utica Free Academy — Principal George C. Sawyer.
Waterford Union School — Principal E. E. Ashley.
West Hebron Union School — Principal J. A. Speer.
West Troy Public School — Principal Fred A. Baldwin.
Whitehall Union School — Principal A. G. Miller.
President William De W. Hyde, Bowdoin College, Me.
President James McCosh, College of New Jersey, Princeton.
Professor P. V. Veeder, Lake Forest University, Ill.
Oliver P. Steves, State Model School, Trenton, N. J.
Rev. W. Bannard, Camden, N. J.
Miss May E. Downey, Talladega College, Alabama.
Principal F. M. Wilson, Newtown Academy, Ct.
Rev. F. Constantine, C. P., West Hoboken, N. J.
C. W. Bardeen, Editor School Bulletin, Syracuse.
Ex-Principal M. P. Cavert, Rhinebeck.
Ex-Principal W. H. Whitney, East Henrietta.
Rev. R. A. Davison, Greenbush.
C. Harris, Greenbush.
Brother Hilarion, Troy.
Brother George, Troy.
Rev. Samuel R. House, M. D., Waterford.
Principal L. S. Packard, Ticonderoga.
Ex-Principal H. H. Snell, Castile.
Principal George H. Quay, Cohoes.
Principal L. F. Robins, East Albany.
Jennie B. McMurray, Margaretville.
Minnie I. Griffin, White Plains.
Ida V. Pratt, Ithaca.
Edgar S. Werner, Editor of the Voice, New York City.
Sarah E. Curry, Albany.
Rev. Ralph Wood Kenyon, Albany.
Rev. George W. Miller, Albany.
Rev. Dr. Andrew Du Plang, Albany.
Dr. H. M. Paine, Albany.
Professor Henry L. Harter, Albany.
John Pumpelly, Albany.
O. A. Griffin, Albany.
Joshua E. Crane, Albany.
C. P. Williams, Albany.
Miss R. Fraleigh, Albany.
Miss Mary E. Le Boeuf, Albany.
Miss Julia Coley, Albany.
Miss Adeline E. Coley.

II.

TACT IN TEACHING.

By Rev. BROTHER NOAH, Manhattan College.

In his admirable "Cambridge Lectures on Teaching," Professor Fitch tells us that "the teacher's profession is no doubt laborious, but it has been well said that it is not labor but vexation that hurts a man. For trouble comes from mismanaged labor, from distasteful labor, from labor which we feel we are doing ill; but not from labor itself, when it is well organized and successful. Then there arises a positive delight in the putting forth of power in the sense that difficulties are being overcome." * * *

"The true teacher," Professor Fitch continues, "ought to be drawn towards the profession by a conviction of personal fitness. * * * * Teaching is the noblest of professions, but the sorriest of trades." Hence the distinction between mere mechanical classwork and that higher form of labor which enables the teacher and the taught to take pleasure even in the hardest kind of intellectual work, will be found in that personal fitness, that adaptability which we designate as tact in teaching.

Webster defines tact as "the ready power of appreciating and doing what is required by circumstances." Perhaps the expression "applied ability" will convey our meaning, or we may define it as "skillful prudence in action." Tact is not mere knowledge, for many eminent scholars are poor professors; just as many eloquent preachers are very indifferent teachers. And Professor Quick tells us that "half the knowledge with twice the power of applying, is better than twice the knowledge with half the power of application."

Tact is not cunning in its ordinary sense, for this implies subterfuge and overreaching. Tact is not mere enthusiasm, for this often betrays what tact is obliged to conceal, and one of tact's chief elements of success lies in its silence. Tact may be said to consist in that unspoken influence which makes students go whither they might otherwise object to being led, in that influence which makes them believe that they are doing what they like, when they are really doing what they ought.

When we are told that "tact has no weight to carry, that it makes no false steps, hits the right nail on the head, loses no time and takes all hints," we have just such an analysis as suits our purposes.

Tact has no weight to carry, for it is the outcome of the rejection of cumbrous and unskilled methods; it makes no false steps, for

the mistakes of others are its warnings. Tact hits the right nail on the head, for its characteristic feature lies in striking only when the nail presents itself, and in clinching an argument when the point is most exposed. Tact loses no time, for one of its essential requisites is that it shall act only at the proper time and with the least possible expenditure of physical and mental power. Tact takes all hints, and in this is the enemy of self-conceit. It is willing to learn from the humblest pupil. Unperceived, it defers to the lowest intelligence, and illustrates anew that sermons may be read from stones, books from brooks, wisdom learned everywhere. Tact is the oil which makes the most complicated machinery move with rhythmic regularity; it is the grace of movement which changes the uncouth into the gentle step; which strengthens while seeming to repress, and hastens while appearing to restrain. Tact may be described as the co-efficient, or, better, the exponent which gives value to and determines teaching ability. Tact, to the professor, is like deftness of hand to the mechanic, or delicacy of touch to the musician. Tact does the same work as its neighbor, but gives it an entirely different aspect. Unblessed with this requirement, the professor labors hard and long, yet his subject remains unattractive, his students uninterested, his results indeterminate.

But in what is tact seen; what is its test? Brother Achille, in his work on methodology, tells us that the test of knowledge is seen in the power of questioning, and that a teacher's value may be determined by the amount of chalk that he uses; and Prof. Fitch assures us that the art of putting a fair question implies a knowledge of the subject. We may therefore say that tact in teaching is seen in the power of illustration, and in the facility with which students are induced to labor; for, as Dupanloup says, "What the professor does is nothing in comparison to what he makes his pupils accomplish."

The example of the Model Teacher amply bears us out. In all his dealings with men he brought his dealings to the level of the lowliest intelligences. Such was the attractiveness of his methods that he was followed through cities, by the seashore, to the mountain heights and into desert places. Such were his beauty of illustration and his aptness in delineation that men followed him for days, thinking not what they should eat, and in evening's chills overlooking wherewith they were clothed.

A close study of the methods of the Divine Teacher will more fully illustrate our meaning. With the first disciples, his illustrations were taken from the sea and its varied phases. To the tax-gatherers and the lawyers, he spoke of the coin of the tribute; with tillers of the soil, the birds of the air, the seed, the husbandman and his occupations formed the burthen of his conversation and instruction. Yet, with such simple elements, so great was his force and beauty of language that it was universally admitted, "Never did man speak like this man."

Tact requires that the professor shall be intimately acquainted with the individual characteristics, the leanings and prejudices of his class. Few professors can afford to join in students' games, yet he loses one of his most telling sources of influence who is unacquainted with the points of their leading amusements. Nothing that is of interest to the student can be of little moment to the class tactician.

It is in this power of illustration from subjects that directly interest the student that tact shows its greatest strength and proves its greatest ability.

It is fair to say that the American student has finer perceptive powers, a keener sense of contrast than any other, while we must also admit that he is less profound than some of his European rivals for intellectual supremacy. But this keenness renders the use of illustration the more difficult to employ. It is not always easy to bring out a contrast without exaggeration; now the American student has an abnormal sense of the ridiculous, and any illustration which ventures too close to the line where mere contrast verges into excess, will strike the average American student and ruin otherwise well laid plans for the simplification of subjects. This leads to an important remark: Tact in teaching is inseparable from forethought. Nothing must be left to chance, though the best planned programme of illustration must, if tactically employed, appear spontaneous. The perfection of tact, like the highest form of art, lies in its seeming absence.

Tact in teaching requires the professor to bring the student up to a higher, while seeming, personally, to descend to a lower plane. He rarely expresses surprise that the student has done so little, but rather that, under the circumstances, he has done so much. In so acting, the professor is protecting his own position, for it is universally admitted that a class is what the professor makes it.

The tactician does not make it a study to insist upon the ignorance of his students; he does not seek, generally speaking, to convince them that they know nothing; his endeavor is to find out, and to make the student discover the many things which have been already learned. He does not strive to force conviction upon his class; he respects individual opinion, and while paying deference to legitimate objections, induces his hearers to admit certain principles, after which he gradually leads them to admit the truth which he wishes to establish.

The tact thus displayed in eliciting thought and enabling students to co-ordinate their already acquired knowledge, is among the most interesting studies of an intellectual observer.

Let us take a simple history lesson: The unskilled professor allows his students to wade through a maze of facts and events without co-ordination, to such a class Cæsar and Pompey, Alexander and Xerxes, Aristotle and Seneca were men who came and went; some of them fought a certain number of battles and

killed a certain number of human beings; others wrote books and talked philosophy. Here information ceases. But, place the same class and subject in the hands of a professor who has the secret of success which tact alone can confer. He puts the matter in a new light. In his hands, historical facts are no longer a thousand or two thousand years old; they appear clothed with living reality. Alexander has his counterpart in Napoleon I; Cæsar's closing years are repeated under the Third Empire; exhausted and sensual Turkey renews the history of Persia's inanition; modern extravagance reads the handwriting of punishment in the pages of Roman history; Carthage and Rome are seen again in the contest for supremacy between the greatest colonial power of modern times and the watchful schemers who control the greatest armies the world has ever seen.

Is natural history on the tapis? Teaching tact does not go to Africa for blades of grass; the birds of our native heaths furnish song and feather of sufficient beauty for all practical purposes.

In the literary field, the class tactician is no less happy. St. Thomas Aquinas christianizes Aristotle; Bacon recalls Seneca; Junius modernizes Juvenal; Hume pilfers from the Angel of the Schools; Newman and Wiseman are later editions of Augustine; Keble, Heber and Faber sing again the songs of Chrysostom and Ambrose; modern philosophic fallacies are chamelionized tints of effete Greek sophistries; Tennyson lives with the spirits of mediæval times; Longfellow sings anew the stories of northern climes, and again the songs of Europe's southern homes; Emerson reflects the varied tints of the choicest thoughts from home and foreign intellectual gardens; Milton speaks heavenly tongue in human words; the ever ancient becomes the ever new, and the whole world drops its richest, rarest lessons into the lap of fortunate students whose professor has something to say and knows how to say it.

We do not pretend that tact in teaching removes the effort required in study, but it does enable the professor to overcome the natural aversion that youth finds for intellectual labor. By skillful management he succeeds in establishing generous rivalry between members of the same class. The satisfaction of victory causes the drudgery of study to be forgotten, and lessons are learned more as a matter of love than of labor.

In the hands of the tactician, even students' faults, when frankly acknowledged and repaired, are used as incentives to future success; for mistakes are so much learned when thus turned to good account. The professor is able to show his students that the great evil is not so much the making of a blunder as its deliberate repetition. Tact enables the professor to make his own past stumblings stepping stones to a higher plane of action and greater tactical skill, and thus he learns what the gentle Francis De Sales so aptly styles "the art of utilizing one's faults." The rebound from error of

plan or programme places the tactical teacher so much the nearer to, and therefore makes him the surer of, ultimate success. It is chiefly in this that the professor realizes the most divine work of drawing good from evil.

With such a professor, the beau ideal of De La Salle is realized, "Students consider it a privilege to attend, and a punishment to be deprived of his lessons."

Remarks of Principal Joseph E. King, Fort Edward Collegiate Institute.

Mr. Chancellor.— I cannot forbear to stand up and express my delight in this very excellent paper, which, however, has caused me a twinge of pain in the philosophical reflection, that the true teacher is born and not made. Doubtless tact, as a study, may be attainable within certain limitations, but of all the dreary things in this world, commend me to the business of trying to make a teacher out of timber that God never meant should teach. I would rather a thousand times undertake to reinforce my board of teachers by a bright young man, sound in heart, and loving work, and loving truth, with sufficient natural capacity, who has never been within a thousand miles of any books upon methods or any dissertations upon object teaching.

If he has mother wit in him, let his fresh, untrammeled soul come in contact with his duty, and he will devise something better than the book-makers have made.

Remarks of Principal E. H. Cook, Potsdam Normal School.

Mr. Chancellor.— He may devise something better, as the gentleman has said, than the books will print, but it will be at the expense of the children upon whom he experiments while he is devising the methods. (Laughter and applause.)

I believe, sir, in gathering up all that has been learned in the past, and we cannot get too much there. I believe in the honest soul, in the lively boy, but I belive that we who have come up through these years of experience, can look back with sorrow and remember when the days were when we had not the teachings that were so admirably given in the paper before us. I thought as I sat here this morning, oh! oh! that twenty-six years ago when I began the work of a schoolmaster, I could have listened to the word that came from that admirable paper, that I could have had pointed out some things which in our younger days we did not have pointed out. I believe that tact in teaching comes, a great deal of it from study, and from the study of the best in the history of the past. This idea, sir, that a man is born a schoolmaster is erroneous. A man is no more born a schoolmaster than he is born a lawyer, or a doctor, or any other profession in life. It comes from study; hard work; and there is an ideal that he should reach after and that he cannot get by having it born into him.

III.

INDUSTRIAL EDUCATION.

By Supt. S. G. Love, Jamestown, N. Y.

"Industrial or manual training. Is it practicable? How can it be accomplished?" (Prof. J. E. Bradley in a letter asking for this paper.)

It is to be greatly regretted that General Webb is not present to give us the philosophy of this feature of education, to present from his large experience some practical lessons which would command universal acceptance. I shall be able to produce simply a few facts and principles, drawn mainly from personal experience, not large, nor possibly particularly important, but still covering twelve years or more of diligent, thoughtful, persevering experiment.

"Is industrial or manual training practicable?" Just so far as it is useful, just in keeping with its importance, it is; and it must be, and will be accomplished. If it ranks in its benefits to the recipient, with the study of numbers, or language, it should, and it will in good time take its place beside them in the curricula of our schools. So in proportion as it is seen to be useful, as we learn that it constitutes an essential element in the education of youth, it will become a part of their daily duties in the schools. Hence the test of the practicability of training in the manual arts in our schools must be made by determining the degree of its usefulness; and I venture to state just here, that it would be the part of wisdom if some of the recognized subjects of study could be more carefully measured by the same standard.

But let us apply the test of the usefulness of manual training as a feature of education.

We start out with this proposition: That any system of education that does not have for its object in some degree the self-sustenance of the recipient, that does not aid him in becoming a producer, is radically defective. Fifty or sixty years ago, an education in the schools of that day was a sufficient guaranty for a livelihood. The recipient could step to his place in business, commercial or professional life, and woo and win success. There were few competitors for the places of educated men and women, and they were the acknowledged superiors of the uneducated masses.

This is not the case to-day. An education obtained from books and competent instructors does not necessarily aid one in becoming a good bread-winner. It is a noticeable fact that very many of our youth who complete the course of instruction in our high schools,

have but one resource for obtaining a living by their own labor, and that is teaching. They are effectually shut out from the rest of the world until they shall have learned to do something, learned to use their hands in some useful industry; and so in sheer disgust they not frequently give their education to the dogs and go to work. But not always. The ranks of the idlers and the demagogues are often replenished by them.

In the education of our youth we proceed upon the theory that they are purely intellectual beings, and hence that the pursuits of the school should be for the sole purpose of developing the intellect. Now the fact is, children, as well as men and women, are animals, having physical organisms to be trained and developed. The physical nature makes it necessary for them to know something of the physical world, objects that they can see, taste and handle with their hands. And the better they know this outer world, how to mould, change, transform it, to a useful purpose, the more likely are they to be included among those the fittest to survive. The earlier they are introduced into this field of labor, experience, the better hold do they have of life, and the more serviceable may they become to themselves and others.

Self-made men and women, so called, take their places among the great and powerful by being compelled, through necessity, to become familiar with work, to learn to do, as well as to study books. They have had manual training all their lives. Wendell Phillips says, the best education in the world is that got by struggling to get a living.

The great majority of children and youth prefer to do something, go on errands, do some kind of work that is pleasant, agreeable, to the drudgery of study, trying to obtain useful information from a book. Call for a messenger in a school-room full of pupils and three-fourths of them will jump at the opportunity of getting away. The life of a student is not natural to them, and notwithstanding the best and most wisely directed efforts of the best instructors, they will give up efforts in that direction, when once free from the restraints of the school-room. They do not expect to live by study. They do not want to, and they will not. They do expect to work, and if they were early and wisely trained to use their powers in learning to do a great variety of things, it would help them materially on the high road to good living and aspirations for success.

No, we need not even think of giving up the school, but only add to the courses of study, or substitute for some things of less importance, a careful continuous training in the manual arts. In this way the youth are kept down to practical views of life, and a close alliance with the things from which they are fed, clothed and sheltered. The healthiest, clearest, most vigorous minds are unusually found in bodies which tread the earth with the proud consciousness, that they know how to appropriate and use some of the good things contained therein.

It seems to me that it is the height of unwisdom to keep young children, and youth as well, all the day at work upon subjects in which they have little interest, small power to appreciate, and weak memories to retain what they neither understand nor care for, when a way is open to interest them, open to their understandings, more directly calculated to prepare the way for a true development of character. Is there not a suspicion abroad that young children, especially in our graded schools, are trying to learn too much and too many things from books; that the confinement of the school-room is not evenly adjusted for the growth and strength of the body, that so much study of subjects above their powers and aspirations has a tendency to weaken their love of knowledge? Are not some people thinking and saying that the curricula of our primary and secondary schools need to be revised and corrected, substituting the word "*do*" for the word "*study*," so that they may do more and study less? The difference between the study of books and the manual arts, is just this: After the work of learning, committing, comes the examination, and like the boy who planted some beans and then proceeded to dig them up every few hours to see if they were there, and how getting along, we undertake to determine by questions, not always legitimate, the contents of his storehouse of learning, and some portion of it being beyond his years and experience, the result is not satisfactory to either teacher or pupil. The examination being over, the interest is gone, and the memory fails to retain; while the training in the manual arts, the lessons, the experiences are permitted to remain in the mind for suitable digestion and assimilation. There is no premature search after what he knows, no fear of catechists or catechisms, until his thoughts have ripened and he has something to say.

The movements of a child, with the body, the hands, the eyes are at first, without meaning, mechanical, emotional, more or less unconscious, but by experience, training, they become intellectual, more or less under the direction of the mind. The infant in learning to talk uses words without knowing the meaning of them, and often with no definite purpose of expressing an idea or thought; the incoherent utterances are simply manifestations of a fullness of animal life, an overflow of spirits; but through the careful, skillful efforts of the mother and friends, and the influence of companions these unmeaning expressions rise to an intellectual apprehension of their meaning. So the first efforts of the child at school are more or less mechanical, unmeaning, but by experience and practice the mental processes are mastered and at length become more and more complicated.

In a similar condition we find them with regard to the use of their hands and eyes, in forming, molding and making objects useful and beautiful; and in a similar manner, if at all, must these powers, faculties, be trained and developed. So as we believe it wise to have our children grow to manhood and womanhood, with some

knowledge of language, mathematics and the sciences, why not also give them some practical knowledge of the things they live by, are clothed with and sheltered under? Why not give them instruction in the manual arts? We do not teach the professions in our public schools, nor should we the trades, but simply give them as much instruction, experience as will enable them to chose wisely when finally they are ready to enter upon their life work. A young man at this period of his life, who knows his powers for work with his hands, who has been trained more or less in the manual arts, in addition to intellectual culture, has a decided advantage over those who have not, and why not in the name of human progress give it to him in the school, as the chances are that he will get it nowhere else.

If education in the manual arts, either from necessity or choice, at school or in the struggle to get a living, is an essential factor in a successful life, then these young people who have been trained in this as well as other departments, are certainly fortunate, while they have no better claim than others without these advantages. And if it can be shown that manual training is important in one instance of a successful career, the claim is good for all the children and youth in the land.

In all of our schools we find a greater or less number of pupils who for some sufficient cause do not take kindly to books and study. They may be faithful, but they are weak; they may be willing, but they cannot accomplish their tasks; they may be dull, but they are also indifferent. These classes of pupils cover a large field of the educational work of the teacher. And what becomes of them? Some of them fall out early by the way, some continue the unequal struggle, blindly groping their way, until thick darkness envelops them and they, too, fall out. Others still hold on, encountering persuasion, entreaty, threatening, driving, until at last they become incorrigible. They not only can not, but they will not be profited by the best efforts of the instructors. Now I undertake to say that almost every individual in these classes may be reached, may be made intelligent and appreciative, may be made to forsake evil ways, and become attentive and obedient, by simply putting their senses and their hands into harmonious relations with their minds. Training in the manual arts, will accomplish this very desirable result, in many cases, as I know from repeated trials; and under the most favorable circumstances will seldom fail to deeply interest the otherwise indifferent, stupid and incorrigible. The unfolding of the mind is well nigh an accomplished fact, when it is attempted through the use of the eyes and the hands. The world becomes beautiful and attractive to those who are engaged in making it so.

If we compare the time employed in study and research by the pupils in our primary and secondary schools, with that of men and women in the ordinary walks of life, we shall find that the former greatly exceeds the latter. We must also remember that the brains of

the young are in a formative condition, and are not a perfect medium for the action of the mind; that the food taken should to a large extent go to nourish and develop the body; that the growth and development of the brains, the mental powers, should be natural, and not in any sense forced, and that all intellectual work, should be as nearly as possible voluntary and without restraint. Hence the admonition to make the duties of the school-room pleasant and attractive, in order that the pupils may be drawn rather than driven thereto.

And yet we all most thoroughly understand that idleness, listlessness at school is pernicious, fruitful of evil, and none more than those of us who think we have discovered, that under our present system of education the young minds are liable to be over-worked, that they are "fetched through" their annual courses, at a sacrifice of mental vigor for future attainments, and are not infrequently made dull and stupid, instead of active and bright by persistent over-work. We know, too, that, occupation, employment is the foster-mother of industry; that all legitimate success in life depends upon the constant use of the powers of the body and mind. So we say, with a due degree of reserve and modesty, that the manual arts mingled with the study of books and things, suggest a reform much needed, and which should be introduced all through our schools at no distant day.

"Nothing stimulates and quickens the intellect more than the use of mechanical tools. The boy who begins to construct things is compelled at once to begin to think, deliberate, reason, and conclude. As he proceeds he is brought into contact with powerful natural forces. If he would control, direct and apply these forces, he must first master the laws by which they are governed; he must investigate the causes of the phenomena of matter, and it will be strange if from this he is not also led to a study of the phenomena of mind. At the very threshold of practical mechanics a thirst for wisdom is engendered, and the student is irresistibly impelled to investigate the mysteries of philosophy. Thus the training of the eye and the hands reacts upon the brain, stimulating it to excursions into the realm of scientific discovery, in search of facts to be applied in practical forms at the bench and the anvil."

These words of an able writer, a careful thinker and student, and a gentleman of large experience in schools for manual training, apply equally well to the girl who is early initiated into the mysteries of doing and making. She, too, learns that the mind must impress itself upon matter through the eye and the hand, and that by her skill in so doing she may rise to a useful member of society, discovering truths and receiving and conferring benefits. It is to her a priceless endowment.

In all the civilizations of this age, and all past ages for that matter, there has been a constant tendency to divorce labor from brains, and it has generally happened, that brains was the plaintiff in the

suit. Capital has always held the mastery over labor, because it has carried the brains, the requisite mental vigor and foresight, to keep in subjection a partner that ought to stand by its side, equal in honor, equal in authority. If there were 10,000 Powderly's in the United States, intelligent and honest workmen, socialists and anarchists would be relegated to the shades whence they came and where they belong, and capital would have to share the burdens of society with greater liberality, the great problem that agitates with fearful apprehensions the thinking men and women of the land would be solved. If the workmen in the land were as intelligent, as cultured as they ought to be and might be, there would of necessity be a healthy union of labor and capitol, and the prosperity and progress of all classes would be assured.

Under the present state of things, if a young man finds himself without a disposition to work, and he does not have to look far usually, or if a farmer or mechanic has a son with a delicate or diseased constitution, he gets what is called an education, and enters upon one of the professions, and so the ranks of statesmen, lawyers, doctors, preachers and teachers are freely and constantly replenished with weak, inefficient and untrustworthy men.

Now, suppose that all our children and youth, male and female, were trained in the manual arts according to their circumstances and capacities, the same as they are now in the languages and mathematics, would not many of these harmful features of society be remedied, and the world be the better for it? Whatever others may say, or think, or do, I believe that this reform is to be the saving grace of the American republic, and the nations of the old world as well.

But the best, the strongest argument to me, and probably of small importance to others, is a knowledge by actual test of the workings of the manual arts in the schools with which I am connected. During a trial of about six years, there has been a constant growth of the department, until now a great majority of the pupils in the schools receive the benefits of the training to some extent, and in the near future we hope to be able to offer to all a full course in the department. While our board of education would not have thought it possible or even wise to undertake to establish a course of industrial education in the schools, they have promptly and unanimously seconded every effort to give the department a permanent place in the curricula, and any effort to displace it, or any way to cripple its operations, would, I am sure, meet with their determined opposition, while the consciousness of having in some degree been instrumental in putting the children and youth in possession of the advantages of this part of an education, affords a better assurance of having done some good than any other work of a limited career.

And now, if it is the province of education to assist the recipient in obtaining a livelihood, if a part of its purpose should be to make the young familiar with the outer world, to teach the relations of

matter and the development of force, power, practically, if its aim should be to kindle in them a desire to *do* something, as well as to study books, to become workers in the great hive of the industries; if its object should be to develop muscle as well as brain; if it is the part of wisdom to give a portion of the hours of school to establishing harmonious relations between the eye, the hand and the mind; if it is a good thing to teach the pupil that occupation, constant and wisely directed, is the foster-mother of industry, through which comes all legitimate success in life; if the instruction of the school-room should be so directed as to encourage a close and friendly alliance between labor, brains and capital; and if training in the manual arts will materially aid in accomplishing these grand objects, stimulating and quickening the intellect, who shall say that they should not be introduced into all the schools of the land? Who shall deny that they constitute the leading features of the new education, of which we have dreamed, so much needed and so full of promise?

The second question of Dr. Bradley claims our attention for a moment. "How can it be accomplished?" How can we introduce the manual arts into our schools without doing any injury to the cause of education, but rather serve its best interests? The right way to accomplish it, or rather to begin the undertaking in the graded schools of the State, would be to secure the needful legislation, and then follow it up with a proclamation of the Superintendent of Public Instruction directing that the manual arts be taught in these schools, in the same manner as drawing was introduced into the graded schools of the State some ten or twelve years since. The Board of Regents could render efficient service in the work, were it not for the fact that it might possibly be supplemented with too many examinations. But since immediate legislative action cannot be looked for, at least until further tests of its advantages have been made, and the means of its accomplishment determined, voluntary efforts will have to be made by different institutions throughout the State. The press, and thinking men and women, are already giving some attention to the subject, and we may confidently hope that public opinion will ripen so that a decision may be anticipated in the not far distant future.

In order to actually introduce industrial or manual training into our school system, so as to make it a permanent feature, it should be given a place in the curricula by the side of the other subjects. Thus, in our primary departments, the three lowest grades, we would have, 1, Language; 2, Numbers; 3, Objects, or things; 4, Manual Training. We should remember that we have always had manual training to a certain extent in all our schools; as for example, penmanship is a manual art, so is drawing, and so, indeed, is gymnastics, or physical culture.

In the second departments, or the three grades above the primary, we change numbers to arithmetic, and objects to objective teaching; in the grammar school, the seventh, eighth and ninth grades, we

change Language to Languages, and Objective Teaching to Objective Sciences; and in the high school we have, 1, Languages; 2, Mathematics; 3, The Sciences; 4, Manual Arts.

In the primary departments, during the first year or lowest grade, we might have, under the head of Manual Training, block-building, stringing straws, stringing beads, learning colors, tablet laying, paper folding, or anything else suitable to the capacity of the pupils. In the second department, say the fifth grade, or second year, we might have under the same head, sewing over and over, crocheting, paper folding and mounting, and review work, or any other work suited to the capacity of the pupils. In the primary and second departments the boys and girls would be placed in the same class, and do the same work, and the classes organized, called and conducted in the same manner as those in the other subjects.

But in the grammar and high schools the organizing and the conducting of the work becomes a little more complicated. A hint of the way, or perhaps better, a way, may be briefly given, as follows, viz.: At certain hours each day send as many boys as can be accommodated to the shop. They should go at least twice a week for one hour each time. In the same way send girls to the sewing room, and boys and girls to the printing office, if there is one connected with the school. All pupils engaged in this department are expected to do their school-room work out of school hours, or at some other time, which they usually gladly undertake rather than to be deprived of the privileges, of the training in manual work.

In establishing and conducting a department for industrial or manual training, the idea must be abandoned, that pupils should, that they can, or that they do, devote all the hours of school to study and recitations. When they have learned how to be industrious, how to train and use their memories, and where they can have a pleasing object in being industrious, they will accomplish their tasks and have time daily for other work. Plodding and droning in the school-room may be in a great degree wiped out, when there is pleasant work for leisure hours.

Instructors must be had for manual training. In almost every corps of teachers will be found one or more persons who know many things, and who learn other things quite readily. To this class of teachers may be given the charge of the primary and second department classes. We found it convenient to employ a Kindergartner to give a course of practical lectures upon the work for these classes. In the Grammar and High schools an instructor must be employed to teach the girls, which may be done in a sewing room, or in the school-room at stated times during the week. A good janitor who is a mechanic can be employed to instruct the boys in the shop, or if he cannot do it, an older or mature pupil can be put in charge of the shop, and by employing two or more of these, the shop can be kept open for work all the day. And a young man of quick intelligence, and active body and mind, can in a short

time learn to take charge of the printing office. Of course these suggestions are hints for those who may propose to begin the work in a small way.

But there is an expense account connected with this department, even though conducted in a small way. The various kinds of material, tools, type and instructors all cost money. How shall this expense be met? The true way to meet this necessary expenditure, is for the trustees and boards of education to place the amount, great or small, as the case may be, from the general fund at the disposal of the department, which sum may be used for the purposes of purchasing material and securing teachers. It must certainly come to this, in the end, if manual training in our schools is ever adopted by authority of the State.

But for the purposes of experiment, a sufficient sum may be raised by donations from those interested in educational progress and reform. However, we were fortunate in having a fund (called the Exhibition Fund, and raised by public entertainments given by the schools), at our disposal, and quite enough to defray the current expenses of the department while in the experimental stage. This fund we still keep good, and whenever the board of education hesitate or too long delay in granting requests, we draw upon our own little treasury, and if we are right, we know that our measures will be adopted by them in time.

That there must be additional expense in establishing a department for manual training in our schools goes without saying, as most of the good things in this life are achieved by an expenditure of time, labor and money, and usually the better, the greater the cost. And it is greatly to be desired that its merits be carefully and thoroughly tested by good men, in the right kind of communities, in order that the authorities of the State may be enabled to act intelligently upon the subject.

WORK-SHOP INSTRUCTION IN THE COLLEGE OF THE CITY OF NEW YORK.

By Prof. ALFRED G. COMPTON, College of the City of New York.

It is the object of this paper to furnish a succinct statement of the character and amount of the instruction in manual training in the College of the City of New York. While it rarely happens that two institutions of instruction can fashion their courses exactly alike, it is seldom, on the other hand, that one is unable to profit a little by the experience of another. The College of the City of New York is both favorably and unfavorably situated for experiments in the field of the "New Education." It is to its advantage that it admits annually a very large number of students (this year 616), who come from all classes of society and have a great diversity of tastes and aims. On the other hand, it is no small disadvantage that the pressing business demands of a great commercial city, and the straightened circumstances of the families of many of its pupils cause a rapid decrease in its attendance, so that it has to commence the year with very large classes and close with small ones.

There is need of a good name for the kind of instruction given in those mechanical training schools which treat manual training as a part of general education, and which stand aloof, therefore, from the trades schools and industrial schools on the one hand, and the institutes of technology or schools of mechanical engineering on the other. Perhaps the name mechanical technology, used in some of the German schools as being comprehensive, if somewhat vague, and as free from the connotation of missionary or reformatory, or directly utilitarian aims, is as good as any that has been proposed.

The instruction, then, in mechanical technology in our college is given to two different sets of pupils. The first are those who enroll themselves in the special mechanical classes; the second are those who pursue the general collegiate course. The mechanical course is of three years duration, and is designed for those who, as they expect to go out early into industrial or commercial life, look for some instruction which may be of direct practical use to them. In this course, therefore, the time spent by the student in college, twenty hours a week, is about equally divided between academic studies and the more "practical" work of the drawing-room and the work-shop, unless he elects, in place of the latter, the study of "commercial products," or what the Germans call "commercial technology." The collegiate course of five years is nearly the same as the ordinary college course with either ancient or modern languages, with an introductory year to fill the gap between grammar school and college. For students in this course work-

shop practice is elective and after college hours. In both work-shop courses the tasks are the same; the average age of the student at entering is about fourteen years, and the time given to the work-shop is about 144 hours a year for three years.

The equipment for the instruction in mechanical technology is contained in three shops, which, however, are all in one large room, covering a space of thirty-five feet by one-hundred and eighteen, which they divide about equally. The first is the wood-working room, which contains fifteen double benches with closets, affording accommodation for a class of thirty. The second shop is the forge and vise room. It contains forges, vises, anvils, hammers and filing and chipping tools for thirty students. The third shop contains twenty-six spud lathes for wood turning and light metal work, and four engine lathes for heavy metal, turning, screw-cutting, facing and so on.

The three shops correspond to the three years' work. The object of the course is to make the student acquainted with the tools used in working wood and metals, the theory of their construction and the methods of using them and taking care of them, the properties of the materials used, the uses to which they are severally adapted, and the methods of shaping and combining them to secure strength, elegance and economy. The student who goes through the course with success is not expected to become an expert in any trade, but he has acquired a reasonable skill with his hands, and has trained his eye and his judgment to recognize good work, correct forms and true dimensions. The exercises by which it is sought to secure this result are vigorously progressive, from the simplest to the most difficult, and each one is designed to teach some special operation or the use of some tool not known before. It would be tedious to enumerate these exercises here. Every school of the kind has a series of its own, adapted to the time and means at its disposal, and any series that is carefully and progressively arranged is capable of giving good results.

As to the expense of such instruction, while it will vary with its scope and aim, the number taught and the buildings and other resources already available, our experience may serve to some extent as a guide, and I therefore submit the following figures:

1. *Permanent equipment.*

1. Wood-working shop:		
Benches and closets	$706 25	
Tools	748 38	
		$1,454 63
2. Forge and vise shop:		
Forges, including repairs	$130 00	
Anvils and blocks	145 30	
Vises and benches	84 45	
Files, chisels, etc	151 56	
Ventilating fan	443 50	
		954 81

3. Turning shop:		
Spud lathes and benches	$1,032 00	
Countershafts and belts	287 32	
Slide rests	200 00	
Chucks and tools	288 93	
Engine lathes	1,503 42	
Countershafts and belts	35 39	
Tools	98 65	
		$3,445 71
4. Sundries:		
Moulders' tools and sand	$15 30	
Soldering tools	13 75	
Engine and boiler	2,510 00	
Shafting, grindstones, electric light, oil tanks, etc	1,048 10	
		3,587 15
2. Materials used.		
Wood-working (three years)	$468 35	
Forge and vise work (two years)	109 44	
Wood turning (two years)	84 87	
Engine lathe work (one year)	33 66	
		696 32
Total		$10,138 62

From this it is easy to estimate the average cost of the equipment and material on the basis of the number of students taught by us in the several years. These numbers are approximately, taking the average of the maximum and minimum attendance, as follows:

Wood-working class, first year	80	
Wood-working class, second year	90	
Wood-working class, third year	60	
		230
Forge and vise class, second year	47	
Forge and vise class, third year	30	
		77
Lathe class, third year		11
Total		318

or an average of 106 a year. The cost of the permanent equipment therefore has been thus far at the rate of eighty-nine dollars per student. The equipment, however, if tasked to its full capacity would be capable of affording instruction in each shop to five classes of thirty pupils each, or 450 in all.

The average expense per pupil for material used is, in the wood-working class (total expenses, $468.35) $2.03; forge and vise

class (total $109.44), $1.42; lathe class (total expenses $118.53), $10.77.

The last figure is three or four times as large as it should be, as much material has been prepared for future years and for larger classes, and a fair estimate for the three classes would give about two dollars and fifty cents per year for each student for materials of all kinds. To this estimate, which would not vary much whether the classes were large or small, should be added about one dollar a year per student for loss, breakage and wear of tools, and somewhat more perhaps if the classes were large and not well watched.

The expense for instruction has been:

Salary of special instructor, two years	$2,200
Portion of salary of tutor (estimated) two years	1,000
Portion of salary of professor (estimated) three years	1,500
Total	$4,700

This, for 318 pupils taught, gives an average expense of fifteen dollars each.

If it had been practicable to keep the classes at the size originally intended, the cost would have been much less. Indeed, assuming one instructor to be capable of teaching five classes of thirty pupils each for four and one-half hours a week each, and that a suitable instructor can be secured for $1,200 a year, the cost per student would be eight dollars a year, exclusive of superintendence. As it will seldom be practicable to make such arrangements, it will be safe to estimate the cost of instruction at from twelve dollars to twenty dollars a year, and the total cost for instruction and material at fifteen dollars to twenty-five dollars, not including interest on the cost of buildings and permanent equipment.

With regard, finally, to the effect of workshop practice on the progress of the student in other studies, the experience of our college justifies the opinion held by many that such work need not, if properly managed, interfere with scholarship. In our optional course for collegiate students, few of the very highest men enter; few, I mean, of those who are striving for the highest honors, and who must give six or seven hours a day to study. On the other hand, the solid, hard-working students, who do everything well, but do not care much for very high rank, do just as well in the workshop as in the class-room, and seem to be stirred up and made more alert by their shop exercise. This effect, I have no doubt, would be even more marked if it were practicable for us, as it is for colleges that deal with resident students, to make hours of shopwork alternate with hours of recitation. This we cannot do, as our students are dismissed at one o'clock, mostly to distant homes, and those who wish to go into the workshop must do so after college hours. As for the poorer material in the classes, the effect on it is not great. The dull student is generally dull in the

workshop, and generally neither more nor less dull because of the workshop. In some instances a poor student finds that he can do well at the bench, and this success stimulates him to study, but I do not think that any general effect of this kind can be counted on.

On the whole, I think that the workshop adds an element of interest to college life, that it is valuable for gymnastic exercise, while free from the evils often attending athletic sports, that it rounds out and completes the student's education, opening his eyes and his sympathies to many things that he otherwise ignores, and that, in the case of many students, and particularly those of observing minds, it gives to the mathematical and physical studies an interest and a value which they would not otherwise possess.

Remarks of Superintendent S. G. Love.

Mr. Chancellor.—I have no desire to impose any of my work upon this audience. I will simply say in a few words what we are doing there. All the pupils in the branch schools, so called, embracing the first six and lowest grades, receive instruction daily in what we call the manual arts. It is a kindergarten for older pupils, supplemented by work which we have devised for it. Every teacher who has charge of a pupil is required to give that pupil something to do in this department every day; and the classes for this work are organized in the same way as the other classes. Now you may ask where do you get your material, and how do you get it? Well, we have a fund as noticed in my paper. We commenced nineteen years ago accumulating a fund for that purpose. I said, we want things that we cannot get in any other way, so we will have annual exhibitions, which we did, and laid up several hundred dollars each year. We purchased with this fund several pianos; and printing presses, and the types and so forth in a small way; also gymnastic apparatus. Some of the material for the manual training we purchased in New York, and we make a part of it at home. A young lady came to Jamestown some time ago just when we wanted help, who was a kindergarten teacher. She started a kindergarten, but failed to make it a success. Some one said to me "Can't you do something for this young lady?" I said "Yes." She came to me. I said, "I want you to come down next week and talk to my teachers." She said, "I never did that." Then I said, "You are no kindergarten teacher." I said "Come down and lecture to the teachers and I will give you four dollars an hour." She said she was under obligations to her instructor. Her instructor in New York had placed her under bonds not to do anything of the kind. I said "Let your instructor in New York go, and you help yourself; you talk to my teachers, and you shall have the four dollars an hour." In this way forty-five of my teachers made themselves familiar with the work. We then had teachers for all the primary schools. For the boys in the grammar and high schools we now have a shop that is about thirty by forty feet. In the shop

are four benches and three lathes for boys. Additions having been made to the high school building, it became necessary for the Board of Education to employ an assistant janitor a part of the time; and being a good mechanic he was made foreman of the shop and placed in charge of the boys' work one-half of the day. Hereafter he will remain in the shop all the day, since the introduction of natural gas for heating makes it possible. As many of the boys as can be accommodated (six to eight at one time), go to the shop and remain about an hour for work, two or three times a week. They seem to enjoy their duties there very well, and it is pleasant to look in upon them occasionally.

In view of the rapid growth of the schools, it was deemed advisable to employ an assistant teacher to do clerical work in the superintendent's office, and also to take charge of a few classes. This occurred some four or five years since. Gradually this teacher was placed in charge of the industrial department for girls. Released from the greater part of her other duties, she received the classes of girls for sewing and other work in the sewing-room. Here they receive instruction for one hour, two or three times a week, or every other day. We have heretofore had great difficulty in securing permanent teachers for this department. The supposition is fair that they would make good house-keepers; at all events they did marry and drop out. But we believe that we now have a permanent teacher for the place; a woman of mature years, superior ability, and with the avowed purpose of making it her occupation for life. Although in the position but a short time, she organized a graduating class, and, among other things, assisted them to prepare and serve a pleasant banquet for the Board and their friends. We have a cook room with a range in it, a large building, that is eighteen by thirty feet, and two stories high. It was built for a shop in the first place, but was finished as a cook room, because it stands outside of the institute building. Now this teacher has an assistant, and they together devote the larger part of their time to the instruction of the girls in the sewing-room. The girls go to this room in classes of five or six for each teacher. There is also a printing office in this room for the present, with which we do our printing; or as much of it as we can. The last term we issued a catalogue of our library, which embraces some twenty-five hundred volumes. It was published by a couple of pupils, they doing most of the work. One was a member of the graduating class and had a little more time than he would othewise have had, and so the two together published the catalogue. Six pupils can be accommodated at the cases at the same time; and these six pupils, unless they fall out for some cause, remain in the office a year. The first and second terms they learn to set type; the third term they teach others, or have the supervision of some job work, and are at the close of the year supposed to be ready to take a position in any ordinary printing office. I will now undertake to answer any question any gentlemen of the Convocation would like to ask.

Remarks of Principal F. J. Cheney.

Mr. Chancellor.— With your permission I would like to ask Prof. Love a question that arose in my mind from this objection that is made to industrial work of this kind. What effect does this extra work have upon the pursuit of the individual pupil's regular course of study? That is, will it take him a very much longer time to complete the ordinary academic course as laid down by the Regents, and as usually adopted by our academies, by reason of entering into this work or because he takes this extra work? That is one objection I hear made.

Superintendent S. G. Love.— We do not find that it takes from their interest, but rather adds to it, to the amount they accomplish. Sometimes a person who desires to graduate from the academic department gets so pressed for time that he or she will withdraw from the industrial department for the half term, but seldom for any other reason. I began the test for the boys some eight or ten years ago. A teacher had a boy of about fourteen who was utterly incorrigible. She could not do anything with him. He would not work willingly; did just work enough to keep his place in the class. It occurred to me to set him to work. I had the janitor put up a bench in the corner of the basement, where we had some tools. I said to him "The janitor is getting to be a little lazy, I suspect, and we had better take hold and do some portion of his work." We used pen-blocks for holding pens, and the janitor had been in the habit of making them. I told him to go to the janitor and get instructions how to make them. He went down at once and I could see that he was pleased with the idea of doing work. He came back and showed me a pair of the blocks the second day. I said, they are very fair, but not just what they should be, not perfect. He said he would like to try again. "I don't know whether it is better to try you again or not." "Yes, let me try again." Then I knew he was under control. And this is what we have been trying to do for such boys the past years, with greater or less success. I am proposing several changes for the coming year; one is that instead of taking girls to the sewing room from the grammar class — we have nine rooms for the pupils in our grammar classes — instead of doing that, we shall undertake to have the sewing done in the class rooms under the direction of the instructor of this department with the help of the assistant and the teacher in charge of the room. They together will instruct the girls, and at the same time engage them in pleasant, profitable conversation. Each room will have two sewing hours every week. During these hours the boys will be profitably employed in other duties, which cannot be fully indicated at this time. We simply add that some will perhaps remain and learn the use of the needle, others will be sent out to make collections of the land and water snails in the vicinity, and others still in collecting and naming the

different kinds of native woods, and other employments which the circumstances may suggest.

Superintendent A. J. Robb, Cohoes.— Are the boys of Jamestown any more inclined to learn the trades, as we call them, than the boys of other portions of the State?

Superintendent S. G. Love.— I think from the circumstances that they are. It is a large manufacturing town. There is a demand for boys. Just as quick as they can do certain things well there is a demand for them, hence they are liable to be called out early in school life, and hence, also, they are ready to take hold and do something before they go. We have to get hold of them, get them interested, first, if we can.

Principal J. W. Cole.— Do I understand you send these boys to take their share in this shop work?

Superintendent S. G. Love. — That is the case with a great majority in this way. Those sent are selected from those that apply for a place. Several teachers have sent boys there who would not do anything else. Every boy should learn that he must do something.

IV.

THE PRESENT STATUS OF ENTOMOLOGICAL SCIENCE IN THE UNITED STATES.

By J. H. LINTNER, Ph. D., State Entomologist.

It would seem proper that a paper upon the present state of entomological science in our country should be prefaced by a history of its progress. But in two attempts made by me to sketch this history very briefly, the sketches have grown to such a length as in themselves to occupy all the time allotted for this paper. I have therefore laid them aside for the present, and will only ask your indulgence for a few introductory remarks.

EARLY ENTOMOLOGICAL STUDIES.

Entomology, as a science, although its foundations were laid 350 years B. C. by Aristotle, the father of zoölogy, the pupil of Plato, and preceptor of Alexander the Great, can only date in this country to a period within the memory of many of those now living. True, the ravages of insect pests had previously been observed by agriculturists and recorded in agricultural and scientific journals, as those of the "army worm" (then called the black worm), in 1743; of the Hessian fly, in 1768, and of the chinch-bug in 1783. Scientific study and description had been made by Peck, afterward a professor of natural history in Harvard College, of a noted insect pest throughout New England, the canker-worm, in 1795; collections of our insects of considerable magnitude had been made by naturalists from abroad and taken to Europe during the latter half of the eighteenth century, where they were described and named by Linnæus, Fabricius, Drury, and others. A work upon American insects, entitled "Natural History of the Rarer Lepidoptera of Georgia," in two volumes, folio, with colored plates of insects and their early stages, which has justly been styled an "ouvrage de luxe," bears date of 1797, but of the London imprint, having been edited by a distinguished English botanist, and published through the subscriptions largely of the English nobility. As early as 1806 a catalogue of the insects of Pennsylvania was published by Melsheimer, giving the names of 1,363 species, but they were merely traditional names, unaccompanied by descriptions, of which only 205 can now be identified. Yet, while we bear in grateful remembrance these early entomological studies, together with others of the kind that may not now be referred to, it is without disparagement of them that we find the foundation of entomological science in the United

States, in the systematic study, description and publication of our insects by Thomas Say, the author of "American Entomology," the first chapters of which were issued in 1817.

Following these studies came scores of earnest and successful workers, who have contributed in giving to our science the proud position that it now holds. The simple enumeration of their names would be too long a list for the present occasion. The labors of some of them are held in grateful appreciation wherever natural history is cultivated, and they are the acknowledged peers of any of their European collaborators.

Special Studies of Insect Orders.

It is perhaps fortunate that the field of study presented to the entomological student is so broad, that if he would render the best service to the science — instead of frittering his labor over the entire field, he is compelled to become a specialist and confine himself to a single group of ordinal or even family value.

It is for this reason that the knowledge of our insects shows quite unequal development in the several orders in which the class is divided. The two orders that are the most advanced are the Coleoptera (beetles) and the Lepidoptera (butterflies and moths). Of these, the several families have been systematically worked and catalogued, and it is possible for the student to name most of the specimens contained in his cabinet, by the aid of synoptical tables which have been prepared; while in the other five orders (as most generally accepted), the original descriptions will have to be consulted when accessible in their scattered and perplexing distribution throughout numerous scientific journals; or the material for which name and classification is desired, must be submitted to specialists in the orders who have the disposition and the time to devote to such usually unremunerative work.

The Coleoptera, from the facility with which the collections are made and their simple preparation for the cabinet, have received the most study. About ten thousand of our species are known, described and catalogued. A classification of them has been quite recently given (in 1883) in a volume entitled, "Classification of the Coleoptera of North America," by Drs. Leconte and Horn. Not only does this volume afford to the American student the needed facility for his study, but so admirably does it embody and present the fruits of the life labor of one who was peculiarly fitted for the work — Dr. Leconte, whose recent death we mourn—that the new system of classification and order of sequence therein presented, marks so great an advance upon previous systems that it can hardly fail of being accepted by the scientific world.

The attractiveness of the butterflies and moths constituting the order of Lepidoptera as well as the economic importance of their larvæ in their dependence for a food supply so largely upon the crops which are deemed essential to our existence or comfort, have long made

them favorite objects of study. About five thousand species have been described.

The butterflies have been carefully studied and largely illustrated in their several stages. A volume given to the public the present year, prepared by Prof. French, of the Southern Illinois Normal University, for the use of classes in zoölogy and private students, under the title of "The Butterflies of the Eastern United States" (all that region lying east of Nebraska, Kansas and Texas), enables the student, by the aid of synoptic tables, simple descriptions and excellent figures, to identify almost any butterfly pertaining to this Atlantic zoö-geographical province. Of the moths (all of the Lepidoptera not butterflies), several families as the *Sphingidæ*, *Bombycidæ* and *Geometridæ*, have been given good illustration, and all have been advanced through the enthusiastic labors of special students.

While striving to avoid irrelevant detail in this paper, it would not be proper, even in this cursory reference to scientific labor, richly deserving many pages for its simple record, to omit mention of the debt incurred in our very respectable knowledge of our Diptera (flies, gnats, etc.), to Baron von Osten Sacken, for a long time a member of the Russian Legation at Washington, and to his friend Dr. Loew, of Prussia. And, as we recall the "Synopsis of the Neuroptera of North America," and several other kindred publications not much less extensive, which give us about all that we know of our dragon-flies, May-flies, caddis-flies, etc., we cannot forego mention of the name of Dr. Hermann Hagen, the highest living authority in this order, long distinguished in Prussia as one of the leading entomologists of Europe, but many years ago induced by Louis Agassiz to transfer his labors to this country under the temptation of an unexplored Neuropterous fauna, together with the opportunity for its study in a life-professorship of Harvard University.

Commendable progress has been made in the study of our Orthoptera, of which grass-hoppers and crickets are representatives, through the attention given to the order by Mr. Scudder during a long term of years, and later by the members of the United States Entomological Commission in their investigations of the Rocky Mountain locust and allied species. A synopsis of the *Acrididæ* (grass-hoppers) has been published, but some of the families have not been catalogued. To the kindness of Mr. Scudder I am indebted for an estimate of 450 described species of North America (north of Mexico) species, of which 275 are Acridians.

In the Hemiptera (plant lice, scale insects, cicadas, plant bugs, etc.), far less progress has been made than with the same order in Europe. Collections and descriptions, however, have advanced to the extent of permitting the publication of a catalogue. The first part of a catalogue, embracing the sub order of Heteroptera, of which the plant-bugs are typical, has recently been published

giving the names of 1,450 species, while the remaining sub-order of Homoptera is in preparation.

Number of Described Insects.

A comprehensive idea of present acquaintance with our insect fauna, so far as relates to the forms we have to deal with, may be obtained from the following statement:

Dr. Packard, well known from his extensive writings as a leading entomologist, has estimated (although somewhat roughly) that there are within the limits of the United States, 50,000 species of insects. * Of these there are at least (we cannot give the precise number as some of the orders are still uncatalogued) 27,000 described species. †

Literature of the Science.

The literature of American Entomology has become so voluminous, that a good working library for a student whose studies embrace all the orders of insects, would contain at least 500 volumes, and this would need to be supplemented by the privilege of access to some public library where would be found other works needed for occasional reference — not one so barren of scientific publications as our State library, whose catalogue (subject — index) gives but eighty-five entomological titles.

Unfortunately much of the literature, the more recent, and, therefore, the more desirable, is scattered through the publications of scientific societies, government reports, reports of agricultural and horticultural societies and agricultural papers.

Government Publications.— The knowledge of our insects has been greatly promoted through the liberality of the general government in the large number of valuable publications that have been issued and distributed gratuitously by the department of agriculture, the department of the interior and the engineer department of the army.

Smithsonian Institution Publications.—The kindly aid extended by the Smithsonian Institution has proved of incalculable service. Several of the monographs which have contributed so largely to the advance in this department of science owe even their preparation to special requests made by the institution, and to material in considerable part supplied from its collections. We are indebted to it for twenty-two publications on insects.

Serials.— Prompt description of new species, of observations of interest, or of special studies, obtain ready publication in the four serials ‡ (two monthly) that are devoted to current literature. Sixty-

* Hayden's Ninth Annual Report of the United States Geological and Geographical Survey of the Territories for 1875. Washington, 1877, page 590.

† In the several orders as follows: Lepidoptera butterflies (Edward's List., 1884) 614; Moths (Grote Check List., 1882) 3,184; Tineidae, not included by Grote (Chambers' List, 1878), 779; Diptera (Osten Sacken estimate in 1878), 2,500; Coleoptera (Henshaw List of 1885), 9,507; Hemiptera—Heteroptera (Uhler Check List, 1886), 1,448; Hemip.—Homoptera (Uhler estimate) 1,200; Orthoptera (Scudder estimate), 450; Hymenoptera and Neuroptera combined, at least 7,500.

‡ Transactions of the American Entomological Society, Psyche, Entomologica Americana, and the Canadian Entomologist.

three volumes of serials have been issued, including the Canadian Entomologist, published in London, Ontario, with contributors mainly from the United States.

BIBLIOGRAPHY.

The aid in any department of study afforded by proper bibliography is appreciated by every student. The entomological student is fortunate in having probably the most complete bibliography ever prepared of any branch of natural history, in the "Bibliotheca Entomologica" of Dr. H. A. Hagen. The labor involved in a work of this scope, may be appreciated when we state that it was eight years in compilation, involving visits to all the principal capitols and libraries in Europe, and that eight hours a day for three years was devoted to its proof-reading. It embraces all entomological books and papers issued from the earliest times to the year 1862, the time of publication — 18,130 in number, by 5,617 authors. From the year 1874, an annotated biographical record of all writings upon American insects has been given in Psyche. It is now appearing in the form of title-slips which may be used as card catalogues, and has reached the current numbers of 3884.

A bibliography of American Economic Entomology is now in course of preparation by Mr. P. Pickman Mann, of the Entomological Division at Washington, which contains at present about twenty-eight thousand manuscript cards, with the compilation, perhaps, not over half completed.

LIFE-HISTORIES OF INSECTS.

A knowledge of the life-histories of the insects of a country, may properly be taken as a measure of its progress in the science, for such knowledge must ever afford the basis for advancement in the right direction. In the applications of the science to protection from insect injury, it is indispensable, for until we have learned the several phases that insects assume — their habits, their environments — we do not know how, when or where they may be most effectively attacked. To our economic entomologists, therefore, particularly to Dr. Fitch and Prof. Riley, are we indebted for the possession of full life-histories of a large number of our injurious species. Some of the histories that have been given us, in their faithfulness, fullness, details and illustration, might serve as models for all similar work. Special mention deserves to be made of the admirable life-histories of our butterflies, published by Mr. W. H. Edwards, in his two quarto volumes (a third in preparation) of the "Butterflies of North America." No other country can boast of such a series, so laboriously studied, so elaborately given, and so beautifully illustrated.

But in a knowledge of the early stages of our insects, generally, we are much behind European advance. Thus, we may know the larvæ form of one-fifth of our lepidoptera; in Europe, about four-

fifths are known, together with their food-plants. Of our coleoptera, the larvæ of only about two per cent. of the named species have been described, although quite a number are in collections awaiting description and proper illustration.

Anatomical Studies.

The studies of the anatomy of insects have been numerous, and, from their ability, have added much to the biological knowledge of this class of the animal kingdom. Among the many names associated with this advancement may be mentioned those of Packard, Scudder, Hagen, Burgess, Geisler, Minot, Mark, Demmock, Leidy, Wyman and Chambers.

In a recent paper upon the "Systematic Position of the Orthoptera in relation to other Orders of Insects," illustrated by forty plates, Dr. Packard has given an abstract of the results of the examination of the external anatomy of a larger number of forms, including, also, pseudoneuroptera and neuroptera, than had ever before been brought together. He proposes to modify our general seven order classification by separating the pseudo-neuroptera from the neuroptera, and dormatoptera (consisting of a single aberrant and perplexing genus, *forficula*) from the orthoptera. This modification, together with a change made in the last edition of his "Guide" in the elimination of thysanura — a low group of wingless forms showing myriopod features — would give the following sequence of orders: 1. Thysanura; 2. Dormatoptera; 3. Orthoptera; 4. Pseudo-Neuroptera; 5. Hemiptera; 6. Neuroptera; 7. Coleoptera; 8. Diptera; 9. Lepidoptera; 10. Hymenoptera.

Although the Thysanura are so degraded a group in development, it is honored by Dr. Packard with possessing a hypothetical form (a "test type") in which he suggests all of the million of species of insects now peopling the globe may be supposed to have had their origin.

Histological Studies.

Histological studies, consisting of observations of the powers, peculiarities and modifications of the cells that form the tissues of the animal kingdom (as also of the vegetable), and outside of which no life exists, are no longer confined to the medical profession, but have been earnestly entered upon by the zoologist. Until recently histological study of our insects has been neglected, but it may now be regarded as fairly commenced, with every promise of its successful prosecution.

Some valuable studies have lately been made by Dr. Charles Sedgwick Minot, among which may be specially cited his "Histology of the Locust," as given in the Third Report of the U. S. Entomological Commission, in sixty pages and fourteen plates, seven of which are devoted to the brain of the locust.

For other contributions we are indebted to Dr. Packard and Dr. E. L. Mark.

EMBRYOLOGICAL STUDIES.

Contributions of much value to the embryological history of insects have been made in this country, which will compare favorably with those of the German schools. Among several others worthy of particular mention are those of Dr. Packard upon some species of dragon-flies, the currant worm, the locust, and some coleoptera and hymenoptera. An incentive to these studies has been the hope that they might furnish a safe and satisfactory guide in classification, but up to the present they have failed to yield any infallible data. Another incentive should be found in the facility of study afforded in the often transparent egg-envelope of the insect, and in the rapid development of the embryo — in the house-fly, *musca domestica*, a period of only twenty-four hours. Additional inducement is offered in the idea that has been advanced, that the embryological development of an insect should present the series of changes through which it has passed in its evolution from the first hexapod to the rank that the species now holds, *i. e.*, that the egg should furnish an epitome of ancestral history. But this has not been realized. The summary, as presented, is too condensed, and has been, it is claimed, too greatly influenced by a natural tendency to variation, and readiness of adaptation to conditions. Much that is sought for is not to be seen. Missing links mar the continuity as in the evidences of the rocks. And there will always be "missing links" in the chain of evolution with which it is sought to bind all living forms, and all that have had life, to the primordial nucleated cell — itself evolved from inorganic matter through electro-chemical force.

ECONOMIC STUDIES.

The study of insects in their relations with man — of their character, habits, transformations, food-plants, enemies, diseases, etc., — with a view of affording protection from the excessive ravages of a large portion of their number, or of utilizing the benefits that some may subserve — is what is understood as economic entomology. In this particular department we are able to report rapid recent progress, and an advance quite beyond that attained in any other country. For this there are two reasons:

First.— The study is a necessity for us. In no other country are agricultural products subjected to depredations so great as in the United States — a condition resulting from the introduction of a large number of the most injurious insect pests of Europe unattended by their natural parasites, and from the multiplication of species and individuals through the large areas devoted to special crops, as fruit orchards of five hundred acres, and wheat fields of from twenty-five to thirty-five thousand acres.*

Second.— State and National aid extended to the study. Nearly fifty years ago (in 1837), we find unequivocal recognition of the

* First Report on the Insects of New York, 1882, pp. 8, 11.

policy of the State in providing for investigations of this nature, in the instructions by Governor Edward Everett, of Massachusetts, under which that invaluable "Treatise on Insects Injurious to Vegetation," was prepared by Dr. Harris. In them we read as follows: "It is presumed to have been a leading object of the Legislature, in authorizing this survey, to promote the agricultural benefit of the Commonwealth, and you will keep carefully in view the economical relations of every subject of your inquiry, * * * the promotion of comfort and happiness being the great human end of all science."

The example of Massachussetts was followed by New York in 1853, in directing and providing for the investigations of Dr. Fitch, which were so ably continued through a long term of years. To the high estimation in which these reports were held, and the practical results attending them, we are indebted for the subsequent investigations and reports of the State entomologists of Missouri and of Illinois, which have been of a high order. Forty of the State reports on injurious insects have appeared.

An entomologist (Mr. Glover), had been connected with the Department of Agriculture at Washington since 1863, by whom annual reports were issued, but with his study of insects, many other official duties were connected. In 1878, in recognition of the growing importance of the study, an Entomological Division was established, organized for efficient work with a chief and assistant, and facilities for ample illustration and publication given it. From that time to the present, the work of the division has continued to increase in magnitude and importance. Appropriations were made for it the last year, inclusive of a special appropriation for the encouragement of silk-culture in the United States, of $40,000. With such means at its command it has been able to make thorough studies of a large number of our insect pests; special scientific study of certain little known groups (as the *coccidæ*, *chalcididæ*, etc.); of the insect enemies of the cotton, wheat, hops, and other crops; and to publish these investigations in an annual report, having an edition of four hundred thousand copies,* and in bulletins and otherwise.

But the labors of this Division which have particularly contributed to the advancement of economic entomology have been those for the discovery of the most efficient materials for use in the destruction of insects, known as insecticides, and in mechanical devices for their application. Of the former, are the arsenical poisons, pyrethrum, kerosene emulsions, and bisulphide of carbon; of the latter are various spraying pumps, nozzle-forks for under-spraying the cotton-plant, eddy-chambered nozzles, cyclone nozzle, centrifugal throwers, bamboo-hose extension pipes for spraying tall trees, and other like devices in bewildering nomenclature. At the late World's Centennial Exposition at New Orleans, one hundred

* At a cost of at least $50,000.

and seventeen implements for the application of insecticides, either in powder or spray, were exhibited by the Entomological Division, ranging from the simple powder-bellows for household use, to a complicated field atomizer in which the agitating and distributing machinery is operated by the wheels of the cart upon which it is drawn as it scatters its impalpable spray over nine rows of cotton at once.

Additional appropriations have also been made by congress of $10,000 and $15,000 a year, for the investigations by a special commission of the Rocky Mountain locust, the cotton-worm, and a few other insects, whose ravages were so extended as to assume a national importance. The commission has given us the result of its labors in four large octavo volumes (a fifth is in preparation) and in seven bulletins which more than equal another volume in size.

ENTOMOLOGICAL SOCIETIES.

The establishment of entomological societies has contributed much in stimulating the study of our insects. The first society, under the name of the Entomological Society of Pennsylvania, was established at Baltimore in 1842. It would seem to have been a premature organization, resulting in the publication of no papers, probably in the presentation of none, and with a membership that never exceeded the requirements of its official duties.

At the present there are four societies in active operation in the United States and one in Canada; established at Washington, Philadelphia, Brooklyn, Cambridge, Mass., and London, Ontario.* Each of these is issuing publications and has its library and collections. There is also an entomological club connected with the American Association for the Advancement of Science, holding an annual series of meetings for the presentation of papers and general discussions.

It is indicative of interest and efficient labor that American entomologists are sustaining an equal number of societies with our European collaborators, there being five in Europe — of London, Belgium, France, Italy and Russia.

ENTOMOLOGICAL COLLECTIONS.

Several large collections of insects have been brought together in this country, which fully meet the purpose for which collections in natural history are made, viz.: An exhibition of the fauna, more reliable means of naming new material than from published descriptions, preservation of types, opportunity of comparison of native forms with those from other parts of the world, and access to ample material needed for monographic work.

Prominent among the general collections may be mentioned those of the National Museum at Washington, the American Entomo-

* Entomological Society of Washington, American Entomological Society, Brooklyn Entomological Society, Cambridge Entomological Club, and the Entomological Society of Ontario.

logical Society at Philadelphia, and that of the Museum of Comparative Zoölogy at Cambridge, Massachusetts. The last named is the boast and pride of the American student. In it is contained, with every possible appliance for protection from harm, the collection of Coleoptera, which represents the life-labors of Dr. Le Conte, and rich with its 4,000 type specimens, Baron von Osten Sacken's collection of 2,500 Diptera, including his types and those of Dr. Loew, Chambers' collection of *Tineidæ*, the collection made by the Essex Institute of Salem, Massachusetts, and types of Zeigler, Melsheimer, Say and others. But its chief attraction is in its biological collection, in which illustration is given, more or less full, of the natural history of above 5,000 species, in their several stages of development, their characteristic depredations, food-plants, architecture, diseases, the parasites that prey upon them, etc. No other collection of the kind in the world surpasses it, if, indeed, any equals it.

A collection limited to a single order of insects, the Lepidoptera (butterflies and moths) is to be found in Reading, Pa., which is probably the largest ever brought together by a private individual. It has been made by Mr. Herman Strecher, and has attained its present magnitude and value through many years of labor, of privation, and an enthusiastic zeal which has known no limit short of full representation of all American forms, and the possession of the most rare and desirable of exotics of the several continents and islands of the sea, so far as they have been procurable, regardless of their cost. Something of an idea of its extent may be had from the statement that it occupies 600 closely packed drawers of the ordinary German museum size, 16x20, seventy of which are devoted to a single genus of butterflies — *Papilio* (of which our large yellow swallow tail may be taken as a type). The number of named and classified specimens is said by its owner to exceed 70,000.

Entomological Libraries.

A reference to some of the entomological libraries of the United States should be of interest as showing the aid found necessary or desirable to our students in the prosecution of their studies.

The first in importance is that of the Museum of Comparative Zoölogy at Cambridge, Mass., having assumed that rank from the incorporation with it of the private library of Dr. Hagen. It is rich in works on Neuroptera, in Bibliography, and in anatomical, physiological and biological papers. It is judged to contain about 2,000 volumes and 3,000 pamphlets.

Harvard College library contains about 450 volumes.

The Public Library of Boston has about 650 volumes, nearly all standard works and but few pamphlets.

The Boston Society of Natural History reports about 900 volumes and 550 pamphlets. About one-third of the collections formerly constituted the private library of Dr. Harris.

The Astor Library of New York has about 500 volumes.

The Buffalo Society of Natural Sciences has over 500 volumes and about as many pamphlets.

The library of the American Entomological Society at Philadelphia is said to consist of 1,728 volumes, inclusive of some general works, but in part relating to entomology.

The Academy of Natural Sciences of Philadelphia 956 volumes and 554 pamphlets.

The Peabody Institute at Baltimore over 800 volumes.

Of private libraries may be mentioned those of Mr. Scudder, of 765 volumes and nearly 2,000 pamphlets, rich in works on the Orthoptera, butterflies, fossil insects, and the anatomy and embryology of insects.

Prof. Riley's library contains about 700 volumes and 3,000 pamphlets, largely of biological and economic publications.

Dr. Le Conte's library, which has been scattered since his death, was mainly in Coleoptera, and contained 700 volumes and 800 pamphlets.

Dr. Packard's library, 470 volumes and 500 pamphlets, has a special value in its embryological and morphological works.

Mr. Uhler's library, selected with special reference to his studies of the Hemiptera, contains over 300 volumes and 500 pamplets.

The above items are drawn from a publication by Mr. Scudder in 1880, entitled, "The Entomological Libraries of the United States." To bring them to the present time large additions to the figures would be required.

PALÆONTOLOGICAL ENTOMOLGY.

Notwithstanding the abundant wealth of our insect fauna, ever yielding discovery of previously unknown forms, while unnamed and unclassified material is an embarrassment in all of our large collections, the ancestors of these myriad forms have not been permitted to lie neglected in the beds of rock that have held their forms for countless ages. The discovery, several years ago (in 1867), in the Rocky mountains of beds of fossil insects of unsurpassed richness, has given both the opportunity for and the impetus to their study. During the past twenty years Mr. L. H. Scudder has devoted much time to the fossil insects occurring in the Devonian rocks of New Brunswick and in the carboniferous, triassic and tertiary beds of the western States and territories, as may appear from a list of sixty-four publications upon these and European forms, published by him up to 1882. Some tertiary beds of a lake basin at Florissant, in Colorado, have proved by far the most prolific of insect remains in the world. About twelve thousand specimens have been taken from them, representing each of the general seven orders of insects, and hundreds of thousands have been left behind. Among them was the first fossil butterfly ever found in America (nine were known from the tertiaries of Europe), and the

most perfect one ever found. It is described as "in a wonderful state of preservation, the wings expanded as if ready for the cabinet, and absolutely perfect with the exception of a small angle of one wing. The antennæ are nearly perfect. The markings of the wings are perfectly preserved, and in portions of the surface the form of the scales can be determined with the microscope."

Entomology in our Schools.

I regret that I have to report that entomology has not been given the place in our schools that it deserves. In our own State, the Albany Normal School and the Oswego Normal school have given excellent instruction in it — in the latter united with laboratory work. Cornell University sustains a professorship in entomology, with courses of lectures, a laboratory, a large named and classified collection and a library so rich in its serials that every entomological journal published in the world finds place in it. In some of our public schools occasional talks are given upon insects when the teachers may chance to have a taste for the study. Elsewhere lectures upon entomology are given in course at Harvard University, the State College of Maine, the Michigan State Agricultural College, Purdue University at Lafayette, Ind., the Illinois Industrial University, the Iowa Agricultural College and the Kansas State Agricultural College. In each of the State institutions particular attention is paid to the economic aspect of the science. In some of the common schools in California, the science is taught and collections are made by the pupils, in consideration of the interest lately aroused by the great increase of fruit insects in that State.

The above, with the exception of some academic instruction in other States, is the sum, so far as known to me, of what is being done in our institutions of learning in this department of science.

Will you pardon me if I go beyond the scope of my topic, to enter a protest against this neglect of the study? Its importance, viewed from a utilitarian standpoint alone, as might easily be shown, entitles it to a reasonable share of attention. Compare it, if you please, in practical importance, with the study of botany, which has become so popular in our schools. Some idea of its importance may be obtained from the statement that careful computations, based upon the census returns of the agricultural products of the United States, show annual losses to these products of two hundred millions of dollars, a large proportion of which are preventable. In interest, nothing in the range of natural history can equal the study of the wonderfully varied habits of insects and their marvelous transformations. As a mental discipline, it is fully equal to the study of the classics, in its stimulation of the powers of observation, comparison, discrimination, memory, while it tends to promote habits of study, industry, delicate manipulation, order,

neatness and precision, which cannot but prove of service in any occupation or position in life.

Have we the text-books for school instruction, such as found in other branches of natural history — in botany, for example? No, we have not; nor can we have, nor are they needed. The synoptic tables and brief descriptions that would be required for the identification of our United States species, with only twice the space devoted to an insect that is given to a plant, would occupy, as I have computed, forty volumes of the size of Gray's School and Field Book of Botany. But identification of species is not the end of entomological study. With "Packard's Guide to the Study of Insects" in the hands of the teacher, and with such assistance as would be suggested by it, he could soon prepare himself to give better instruction than that usually obtained from text-books alone. No branch offers such facilities for object-teaching. The objects are almost innumerable — they cost nothing — they even come to you unsought You can take one hundred species of flies alone from your window-panes. Surely, there is no valid reason for not introducing at once this study in our schools.

Is it *right*, I would ask, in passing, and I use the word in its full import as antithetical to wrong, that the 283 academies and academical departments in our State should be able to report but fifty-one of their number as giving instruction in zoölogy — less than one-fifth? And yet this is the study that would teach of those wonderful organizations, instinct with life and intelligence, associated with us upon a globe in which the adaptations to their wants are as perfect as are our own, and each with a structure in which God is revealed as unmistakably and as clearly as in the structure of the universe.

In closing this sketch, quite imperfect from the brief time that could be devoted to it, I desire, Mr. Chancellor, to express to you and to your Honorable Board, the obligations and the gratitude of American entomologists for the encouragement that for so many years you have continued to extend to this department of study. The resumption of economic studies under State authority and provision, after an intermission of a term of years, was largely owing to your instrumentality, and to your recognition of their usefulness in the promotion of the agricultural interests of the commonwealth and of the country.

V.

HAS THE COLLEGE A LOGICAL PLACE IN THE AMERICAN SYSTEM OF EDUCATION?

By Prof. Oren Root, Hamilton College.

At the last meeting of the National Educational Association, a paper was read entitled "The Relation of Secondary Education to the American University Problem." The first two years of college were there classed as academic; its last two as university years, and the paper foreshadowed the gradual absorption of our colleges by academies on the one side and universities on the other. In thought upon this paper the question arose "Has the American College a logical place in our scheme of education?" Does it belong here? Or, in the complete evolution of the system, is it to be practically blotted out?

The history of the American college makes a strong presumption in favor of its continued existence. It came to answer the needs and prayers of our fathers, and has grown with growing demands, widening its stakes and deepening its channels, yet holding the same spirit and filling the same relative place. To whatever call, the American College, so far as its proper province runs, has answered well. It has given leaders in every line of movement, men of affairs as well as men of thought. Even for aggressive scholarship and original research, the American College has served well in its place. What in this regard has been left undone, is largely beyond the proper college province, and it must be remembered that, until recently, the conditions of American life have given little call or inducement to pure scholarly work. The burden of proof is upon those who would eliminate the college.

The American college, as a class, includes more than bear the name. Our earlier institutions of higher education were, I think, all called colleges, save the "University of Virginia." Harvard, Columbia, Yale, Dartmouth, Princeton, are colleges. Later institutions used the name "university" with one of three notions: (1) To mark the absence of the usual working lines and rigid requirements — as the University of Virginia; (2) to indicate the association of different schools under the same general control — as those institutions having theological or medical departments; or, (3) to set up a nominal dignity which might at some time be filled. Our higher institutions are, however, as yet, most of them — whether with or without attachments — colleges, not universities.

The American college is an institution of learning with special reference to culture. It takes the youth from the academy or high

school and leads him along the paths of discipline and study to the threshold of his manhood and his work. It is not the German gymnasium; it is not like the sisterhood which, grouped, make Oxford and Cambridge. It has come to form in the matrix of American — not German or English — life, and is to answer the logic of our needs.

Our primary schools, including "grammar" and "intermediate" grades, give the rudiments of knowledge; they save from absolute illiteracy. Our secondary schools, academies, seminaries, high schools, give the elements of knowledge, awaken desire, strengthen mental activities, prepare students for broader work; they furnish the basis for intelligent citizenship. What does the college do? Unless there be a work for the college as distinct and marked as that of grammar school or academy, and leaving place for a properly defined and logically sequent university, then the college must go; go in reality, even though the name survive. It seems to me that the American College has such a work as to justify its perpetuity in substance and in form. This work is distinct from that of the schools, precedent or subsequent, in two lines: (1) In the circumstances and conditions of study; and (2) In the character of the mental growth and the views of knowledge given.

The circumstances and conditions of college study come mainly from the attitude of the institution, its laws and its instructors, towards the student. The grammar school deals with children; the high school with boys and girls; in both there is constantly the attitude "*in loco parentis.*" Work is carefully assigned; methods, manner, times are prescribed; the teacher is present or imminent constantly. In the great majority of high schools there is also the home influence to which the pupil returns daily. The college removes the restraint of presence and constant attention of the teacher; but properly preserves the personal influence of the instructor. The youth at college has usually swung out from home; but is not as yet ready to be thrown wholly upon his own responsibility. It is very easy to win applause from the boys for relaxation of rules and system; but is it well? And does the plaudit outlast the cooler second thought of the boys themselves? No doubt some will go forward steadily, successfully; but how of those who might, but do not? Is it well to pass from detailed tutelage to entire liberty at a bound? In the college where I teach I find occasion frequently to reach personally students who seem to be tending the wrong way. There is no college class where a goodly number does not need some guidance. Such personal influence is not merely a safe-guard; it should be an inspiration, and for young minds this is worth the while.

The college properly differs from the academy in greater freedom, fewer restrictions, more liberty in times and seasons; more latitude as to the amount and style of work and in due time in some choice of subjects for study.

In this relaxation of restraint, however, authority is still asserted and the student is still under guidance. The field and limits of study are prescribed; the results of study are tested; the instructor meets the student in the class-room, and his personal purposes are steadily reinforced. Herein the college has a place which the university does not fill. The university throws the student at once upon his own responsibility; it assumes definite purposes in the student; offers facilities for carrying them out; grants scholastic place and honor to those who do this; it drops those who do not. College work is peculiar in character. Primary grades of school teach mere knowledge; the knowing, thing by thing — a knowledge connected, if at all, by superficial or accidental ties, rather than those essential and generic.

Secondary schools lead the pupils to digest what is learned; more thinking is done; what is gained is digested knowledge. It becomes a part of the student's self and gives power. But the product is not complete. What work has the college?

Its first two years continue the lines of study followed in the preparatory schools; but there is a change in the character of the work. The knowledge appears more in its relations, and is considered in broad connection. Subjects are grasped more as wholes, and behind facts and specific laws underlying related principles are discerned. From the beginning of freshman year what is taught looks forward and outward. If I may illustrate from my own department, geometry reaches on and in the teacher's thought, takes hold on the very advance posts of modern methods; and the students begin to realize mathematics. So in other lines of study.

In the advanced years of the college course, new subjects are introduced; the relations become wider and more complex; the student is led in his thinking to go more deeply; but it is a broadening of earlier college work — new only in the subjects treated not in its character or its influence.

Throughout the course the college adds to the knowledge the notion of its relations to other knowledge, and so gives it peculiarly "*in situ.*"

College work, differing thus from that of secondary schools, differs from University work, in the absence of the aggressive, productive character which is the latest phase of mental activity. After digested knowledge and the grasp of its relations, is germinant knowledge whereby the student becomes the self-purposed scholar, an independent worker. This with the majority of college men has always followed college work. The student begins *to do*; what he has learned asserts right of domain in specific regions and goes forth for conquest. There have always been schools which represented this work on certain lines. The young man puts his brain power upon theology, medicine, law; the schools in these departments direct and strengthen the productive powers and the man becomes a clergyman, a physician, a lawyer. But the same

stage of development comes in some form to every educated man, not stunted; the university concentrates, organizes, directs, facilitates this work. The university has work properly sequent to the college.

The academy cannot do college work because it is properly occupied in supplying material for rapidly growing powers and in strengthening them through digested knowledge. To call attention too early to the wide relations of each fact and principle confuses rather than strengthens the mind. Those who deal with the freshman class in our colleges soon find how puzzled many students become in the effort to grasp complex relations. They grasp one thing; they grasp another thing; an operation requiring the two in relation often confounds them.

The college has other than academic work.

On the other hand, the university is not adapted to do the college work. There enters the temptation to premature specialization and immature productiveness.

The student untrained in the relations of truth, starts upon narrow lines of investigation, frames theories, draws conclusions and there is developed too often a hobbyrider — a narrow man stretched out rather than a broad man built up. The work of the college is other than that of the university.

The purpose of the college is peculiarly what is called "culture." The academy leaves the youth crude; it may shape his purposes; it does not give polish.

The university sets the youth at work, makes him a unit, specific, independent; it develops angles and sharpens points. Between these two stands the college, broadening knowledge, maturing powers, giving depth and richness to thought and expression. Surely this culture is needed. The immediately practical is not the highest idea of education, nor is the development and outworking of a specialty the only good result of study. To specialize is well, but not at the sacrifice of breadth and culture.

Our grandmothers in their knitting knew when to begin to narrow, and they did it, not too soon or too fast.

I do not believe that American youth can afford to put aside the college stage in their education. I do not crave for my own college that it be a university; I feel that it is better that we perfect, so far as we may, the work peculiar to the American college. I do not believe that the different phases of work in our system of education can be well combined. Primary classes in the academy are rarely as well trained as in the organized primary schools. Preparatory departments have been generally recognized as a burden upon colleges.

It is my conviction that collegiate departments in universities are likely to be overslaughed in the sweep of the higher, wider work about them. I hail gladly the coming of American universities; I urge often upon gradutes the need and value of university work. But I cannot grant that the college has not a logical place in our educational system. The American college, "justified of her children," has, to my mind, in character and work, ample claim for continued existence.

HAS THE COLLEGE A LOGICAL PLACE IN THE AMERICAN SYSTEM OF EDUCATION?

By Prof. S. G. Williams, Cornell University.

The work of elaborating harmonious systems of education, consistent in all their parts, giving due recognition and their proper place to the great leading departments of knowledge, and adapted to the most pressing needs of the times, and, more than all, fitted to the circumstances, the genius of the institutions of the country in which their work is to be done, is one of the most delicate and important character, one which requires the wisest co-operation of the best intelligence of any country. In the discussions which attend this work, the ardent expressions even of extreme views by various specialties have their value in calling attention vividly to points needing careful attention; but when prudent educators are called upon to *act*, it becomes them to make haste somewhat slowly, to weigh carefully the desirable against the *practicable*, and not too readily to abandon what has been proven good, in grasping after what may, after all, prove to be only illusory advantages. Undoubtedly the system of instruction in Germany has been more definitely thought out and more carefully arranged than any other now existing, and yet in some matters of no subordinate interest, a finality has not yet been reached. The struggle between the advocates of the real school and the gymnasium is by no means ended; and a recent writer on German secondary education, in speaking of the efforts properly to correlate the classical studies in the gymnasium with the study of natural history, mathematics, physics, history and geography, and so to limit all these studies as not to infringe on the sphere of university instruction, says "the solution of this difficult problem has not yet been fully reached, and all the recent movements and discussions on the field of secondary instruction have been more or less connected with it." This, then, is true of a country all whose institutions have been the slow growth of ages, where for more than a century much of the best thought of the wisest and most instructive men has been given to educational questions, and in which, if anywhere, educational system might be expected to have reached a definite and settled shape. In this new land our educational organizations have been the result of immediate and pressing necessities. Meeting at the outset only the most keenly felt wants, they have, at least in our oldest and most prosperous communities, adapted themselves fairly well to our growing needs, and now present the outlines of a system which it is the duty of present and future educators to recast, to extend and to perfect. The papers and discussions of

this body during the twenty-three years of its existence have already contributed much of value to this end; and the volumes of its transactions now form a very valuable collection of pedagogical literature.

Doubtless the executive committee, in proposing the present subject for discussion, has intended it as an introduction to a somewhat new and untrodden field. Yet it cannot strictly be said to open a discussion in this place on the very important topic of the future character of the American college, and of its relations to our growing university system. In 1882 President Chapin in an address, in 1883 Warden Fairbairn and Professor Bennet in papers, and in 1884 Professor Wilson, Regent Fitch, Presidents Anderson and White and others, in addresses and discussions, presented suggestions wholly germane to this subject, indicating as they do the felt necessity of a more thorough and conscious correlation of our higher educational efforts and a better provision for our more advanced students. The special form in which this discussion has been proposed to my respected coadjutor and myself is a somewhat striking one, involving, as it apparently does, the startling question of the logical *raison d'etre* of the college in a consistent American system. To this question, as it appears on its face, I have no doubt that our answers would be well-nigh the same, formed as our educational predilictions have been under the same system, at the same institution and at nearly the same time. Yet neither do I doubt that our views will, on several points, present sufficient divergence to make the form of a discussion not inappropriate. Possibly, also, the stand-point from which we view the subject may prove to be different. My own belief is that our colleges have logically a highly essential place in our educational system, which, however, they have not been content to fill; but, in a vague search after some philosopher's stone that should transmute them into universities, they have engaged in costly wanderings therefrom, and need again to occupy that place with a full consciousness of their rightful work.

Any well-arranged and complete system of education will be likely to comprise three tolerably distinct stages: 1st. Elementary schools intended to impart to all the children of the community such elementary training and such most necessary branches of knowledge as may enable them to lead happy and useful lives. 2d. Higher or secondary schools, not always very conveniently growing out of the first in all respects, in which a much smaller number of youth, whose superior intellectual promise or more fortunate pecuniary condition have set them apart for larger educational advantages, may attain a fuller culture and more extended knowledge. 3d. And crowning the whole superior schools or universities in which young men, thoroughly trained and prepared for independent work, may not only fit themselves for their future special career, but may also gain philosophic and scientific views of its principles

and of its relations to other departments of human activity. Of the first stage little needs here to be said, save this, that however well it may be adapted to the wants of those whose school training must cease at its close, it might profitably be so far modified as to admit the study of Latin during its last two years in the case of those who are looking to a somewhat extended secondary course. In large places, this could readily be done, with little or no additional expense, by bringing such pupils together in distinct classes in an annex to the high school. The work of secondary education, which in some European countries is carried on for eight or nine years in single establishments called variously public schools, gymnasium, real schulen, lysées and communal colleges, is in this country divided between two sets of schools, the high schools or academies, and the colleges. This subdivision has some considerable advantages — (1) Most large places willingly defray by taxation the expenses of the high school, because of the obvious benefits accruing to them from a body of more highly trained youth, thus leaving only the upper half of secondary education to be provided for by fees and endowments; (2) it affords a convenient stopping place for those who cannot remain in school beyond their seventeenth or eighteenth year; and (3) it enables the concentration of the comparatively small number of usually *elite* youth who wish to prosecute their education further, in a much smaller number of establishments where they can be more economically trained.

In my view then, the American college holds the place of the higher grades in secondary education, and should devote all its energies, arrange its courses and adapt its methods to filling this place fully and completely. Possibly some at the outset, may doubt this proposition, and may be inclined to claim for the college a somewhat higher place; but I am persuaded that a careful comparison of the courses of our soundest colleges, *as such*, with those of German, French and English secondary schools, will convince any unprejudiced person that this statement is not unduly depreciatory to our colleges. Professor Bennett, in the scholarly paper to which I have alluded, seems, indeed, to consider the senior college year as of a fairly university character. President Chapin, however, in the thoughtful address delivered here four years ago, expressly claims for the college this higher secondary character; and, in a quotation which he makes and in his comments thereupon, he makes a distinction on which I shall have occasion to dwell somewhat in a succeeding paragraph. It is as follows: "One of our most experienced educators has well marked the distinction between the college and the university thus; 'The college is a training place for minds that are yet immature, in the elements of knowledge and culture; the university is a teaching place for those who are supposed to have been trained to the capacities and responsibilities of incipient manhood.' This distinction should be emphasized. Training and teaching go on together in all the stages of education, but in the college

the training is the main thing, and so it takes the youth at just the period when training tells most effectively." So to one of our respected Regents in the brilliant eulogy which at our Centennial Anniversary he pronounced on the American college, and in which, with a felicity of diction and an aptness of illustration equalled by but few and surpassed by none, he vindicated its claims to a continued and wider recognition, expressed substantially the same view of its sphere as the crown of our American secondary education and a fitting preliminary to the work of the real university. I can heartily echo these words of his — "The integrity of the college system should be maintained. It is the best for practical results, for preparation for higher learning, and for preparation for citizenship. No really intelligent friend of the university will assail the college."

It seems, then, that there is substantial unanimity of opinion among those friends of the college who have given most serious thought to its interests, in regard to its proper sphere and functions, and with these expressed opinions on this fundamental point, I think we may safely set out. They are schools, in the language of President Chapin, where "training is (or should be) the main thing;" or, to use the idea of Regent Fitch, they are schools of "preparation for citizenship" for those who go from them to undertake the duties of life; of "preparation for higher learning" for those who are to gain elsewhere the principles, the methods, the history and the philosophy of various sciences and professions. A recent acute French writer on German education, while deploring the present tendency of French secondary instruction, which he pronounces "foolishly encyclopædic," praises the wisdom of the Germans in preserving in their secondary schools the character of *preparation for something higher*. Their certificate of maturity bears the attestation, not that those who hold it have attained science, but that they are *ripe* for science; "not that they know, but that they are in a condition to know;" and he might have added "not that they have investigated, but that they are prepared to investigate." Now it seems to me that the criticism that may fairly be made upon our American colleges is: (1) That they show a tendency to overlook their legitimate function of preparing for something higher and to aim ambitiously at that something higher for which their students are not yet *ripe;* (2) That yielding to outside pressure, they cut short studies which uniform experience has shown to be best suited for training; crowd their courses with subjects which, whatever their intrinsic importance, are of doubtful value for disciplinary purposes, and are thus tending towards an injudicious and barren encyclopædism; and (3) that by all this, they subject resources, which we could all wish much greater, to too heavy a strain, and diminish their ability to do their proper work efficiently, even where they do not imperil their own existence. It will be well to dwell briefly on each of these points. And, first, let us try to gain some clear conception of the respective functions of college and university to serve as a guide in this examination.

The work of the college is preparatory and disciplinary; that of the university is, above all else, scientific and professional. The proper *clientèle* of the college is made up of youth, needing direction, encouragement, careful instruction, and not infrequently, sharp control; that of the university is young men approaching maturity, needing opportunity, inspiration, wise suggestion, and freedom to choose those lines of intellectual activity where they may most advantageously use their trained abilities. The leading object of the college is to secure the most symmetrical and complete attainable development of the general mental power of its students; in the words of another, "to insure to them ease of combination, correctness of judgment and facility of expression." That of the university is to concentrate these developed faculties on some one line of research, whose methods they may master, to whose original and appropriate sources of information they may find their way, and whose varied relations to and dependencies on other departments of human knowledge they may come to appreciate by actual experience. The duty of the college has been well done when its students are able thoroughly to master and assimilate, and fitly to express the best results which other men have reached; the university achieves success chiefly as it makes its men independent investigators, capable of adding something to the world's stock of knowledge, and confident of their own results, because conscious that they have exhausted all available means of verification — or, as Prof. Von Sybel aptly expresses the university idea, "no man is truly master of any of his powers unless he has with full force applied them to some special problem — up to a point where he can say that there is nobody in this world who on this point and on this subject can teach him any more; a point where he can say that here he stands safe and firm on his own feet and decides entirely by his own judgment." The studies, therefore, on which the college should lay chief stress, as Todhunter, in his "Conflict of Studies," has judiciously observed, should be those in which the thoroughness and accuracy of the student's attainments can best be tested by examinations; the worthiest results of university instruction are usually such as elude mere examination tests and can be judged only by a man's career; for what examination can probe intellectual emancipation?

If these statements, as to the respective functions of the college and the university, be accepted as reasonable, as they certainly are where both classes of institutions have become most thoroughly organized, and in the general opinion of observers are most successfully conducted, I think it may prepare the way not only for the application of the criticisms that have been offered, but also for a better understanding of some interesting educational changes which are now slowly taking place among us. Accept the college as a school for thorough discipline and for careful and definite preparation, a place where youth are to be trained to clearness of

perception, accuracy of judgment and justness of thought and expression, rather than to be made ready to take a place betimes in some particular vocation, and we shall probably have a place where there is somewhat less of width and more of depth; where some subjects of much interest and importance are omitted, both that other subjects may be more thoroughly mastered, and because their adequate treatment would demand more time than the college has to give; where, in short, the lines of study should be few, carefully selected with a view chiefly to their disciplinary value, yet not without some reference to their practical importance also, and so judiciously arranged that they may be mutually helpful and preparatory each for the other. As to just what these lines of study should be, opinions will, doubtless, differ greatly. My own idea would be that they should be not more than four; languages taking a full half of the time; mathematics an eighth, restricted to algebra, geometry and trignometry, but these mastered in preparation for future use; history somewhat more than an eighth, extending through the course, reinforcing the instruction in language, and giving direction largely to the student's reading, and the elements of science, including civics and psychology, all to be studied objectively rather than dogmatically, occupying a little less than one-fourth of the time. This scheme of studies, which looks to sixteen hours of recitation per week, and to which elocution and gymnastics can readily be added, could easily have been omitted, but that would leave the way less definitely prepared for your criticism; and besides its statement naturally raises the question of electives, now so prevalent in our colleges, and on which some instructive discussion has taken place in this Convocation. I am inclined to the opinion that it is just at this point that college and university methods have become mixed. In the university all studies are elective, and should be so. The university does not prescribe courses of study as for youth who still need training, but offers lines of investigation, as to men who having received their training are now competent to select for themselves what is in accordance with their intended career. Now, although it is possibly true, as so often asserted, that we have yet no real universities in America, it is undoubtedly true that several of our institutions which have peculiar advantages of age, resources and location are working carefully and with wise conservatism, but determinately in the direction of university fullness and methods. If it is a wise policy for them, in furtherance of this purpose, to admit a considerable freedom of election in the latter years of their college courses, with reference to the post-graduate work that is offered afterward, it by no means follows that this would be judicious for the large number of other colleges which do not have these advantages, and for lack of them cannot expect to grow towards university characters; nor does it follow that because boys, sometimes at an early age, have outlined their future career, more or less definitely, they are therefore competent

to decide as to the kind and order of the studies which will best fit them for this career and render them strong and useful men therein. I am free to confess that I am by no means convinced of the judiciousness of the elective system for our colleges in general, even if considerations of needful economy did not enter into the question. For the present, at least, we may well follow the example of the Germans who give the boys in their secondary schools all the work that the most diligent can master in prescribed and definitely arranged courses.

The question of definitely arranged parallel courses, made up of different lines of study, is a more difficult one, and though wholly within the legitimate sphere of the college, it seems hardly needful to introduce it here, since it reopens the still unsettled debate as to the value for educational purposes of utilitarian studies. It is proper, however, to remark, from an economic stand-point, that any college before offering such courses may well consider whether it can afford the expense. Better a single curriculum, strongly conducted, than several where devoted professors are overworked in the direct proportion in which they are underpaid. If, however, such differently constituted courses are to be pursued, it seems to me fortunate, where this can be done in the same institution, that youth, trained by somewhat different means, may measure themselves against each other, may learn by experience to value aright each other's acquirements and their results in character, and may gain some conception of how wide and varied the field of human knowledge really is.

The second of the strictures that have been suggested cannot be more forcibly, and yet inoffensively, introduced than by causing it to proceed from our late lamented associate, Professor Tayler Lewis, one of the ablest and most ardent friends of our colleges. In a paper read before this Convocation in 1871, he urged that there should be a larger and more fruitful study of the classics in our colleges, or else that the study should be abandoned altogether, his argument being directed almost wholly to a plea for an increase of the time devoted to the Latin and Greek, and to suggestions for making the instruction more productive. And, indeed, it is difficult to see on what grounds our colleges, which are generally supposed to be the strongholds of classicism, can justify the manner in which most of them cut short the Latin and Greek and make of themselves veritable literary wildernesses, with a multiplicity of other subjects, save on this, that the controlling majority of college men are not themselves profoundly persuaded of the superior value of these languages, and so easily yield to a pressure to supplant them. Let us see how the matter stands with Latin, for example. In the High School it gets at most from four to five hours per week for four years. In most colleges I think that five hours per week for two years is as much as is allotted, making an allowance equivalent to from twenty-five to thirty hours per week

for a year, about one-third of the eighty-six hours that is given in the German gymnasium and only two-thirds of the forty-four hours allotted to it even in the Real-Schule, the aim of which is strongly utilitarian. It is needless to mention Greek, which many of us regret to see tending yearly to be withdrawn more and more into the background and seeming destined soon to be frozen out of our colleges, save in a few sheltered nooks of classic culture. Is it any wonder that those who have pursued Latin and Greek in our colleges should express doubts of their value, since they have rarely advanced far enough in them to make them really a medium of thought or to imbibe the spirit of the noble literature of which they are the repository? Would it not be better if these languages, or at least one of them, which connect our culture, our history, our institutions and our language so closely with all that is best in the past; whose structure, so unique in its perfection, has become as it were embalmed as a model for our study by being no longer subject to the mutations of daily use, and whose pre-eminent value as means of discipline has not only been proved by ages of experience, but is cheerfully acknowledged by the most cultivated nations, should be restored to the place of honor that they merit in our colleges, studied there in such a manner and to such degree that the dead nations that used them should live again to the imagination of generous youth and, above all, studied till the culture that they impart and the mental aptitudes that they develop become fixed and ineradicable habits? If it is expedient that they be studied at all, it is certainly fitting that they be studied until the benefits that are expected from them shall be really gained. The subjects that must give way to yield them their proper place, like the higher mathematics, law, political economy, etc., belong more properly to the university, where they can receive the extended treatment that they demand, if touched at all, or, with well-trained men, they may safely be remitted to the exigences of after life. If our colleges really desire the classics to be held in honor by men of letters and of affairs, let them cultivate them more and eulogize them less.

The third consideration which is to be presented and which is of an economic character, is one which all will doubtless recognize to be of vital importance to the present well-being and future prosperity of our American colleges. A college saddled with expenditures which exceed its revenues is in a situation truly pitiable, and it is one which is sometimes incurred and sometimes aggravated by an ambitious reaching after a university character, or by a desire to cater by multiplied courses to a vague popular longing for something new. A single well defined course of studies admits of being economically conducted by a comparatively small corps of professors, and, with an increase in the number of students, the teaching force may be readily and effectively increased at moderate expense by the addition of instructors acting under the direction of

the responsible heads of departments. But with every addition of new courses, calling for new departments of instruction, new professors and additional equipments, if not buildings, the inevitable tendency is for expenses to increase much more rapidly than the revenues derived from students, so that unless endowments are large and productive the resources become less than the needs, buildings and equipments are found costly to care for and preserve, debts are incurred, professors are ill paid and the college languishes.

Better in every way and more prosperous, though perhaps less splendid to the eye, is the college which lives rigidly within its means and makes no drafts on great expectations, whose single course of studies is so well chosen and so thoroughly conducted as to give it a deserved and ultimately attractive reputation for sound scholarship; whose professors, few it may be, but well and promptly paid, are content to work zealously for a beloved institution; and whose buildings and equipment, effective rather than showy, contain little that is unused and involve a minimum of expense for necessary care. A consideration worth noting, also, in this connection is that such an institution is much more likely to attract the benefactions of the wealthy than one which is struggling with ill-adjusted finances. Liberal minded men give cheerfully where there is a prospect that their benefactions will be a permanent boon to scholarship; they hesitate long before flinging money into a maelstrom of debt.

To conclude this discussion, then, I believe that when our educational institutions shall have settled into the system towards which they are slowly tending, universities will be few, probably not more than one to two or three millions of population; that in them will center not only the four usually recognized faculties of philosophy, theology, law and medicine, now often widely scattered, but also that fifth faculty of economics, which Leibnitz proposed 200 years ago, and which is now attached to some universities; that to them will be affiliated as loyal auxiliaries many collgees, suited in numbers to the public needs, judiciously located near centers of population and of culture, that they may best subserve these needs; content to do their own part of the work of education thoroughly, and without vague strivings after something higher; content, also, to subordinate denominational spirit to Christian charity, and vieing with each other only in a generous emulation of deep and thorough scholarship.

I have no doubt that many colleges now having a name to live will die out, because they have been unwisely located, or because hastily founded without sufficient resources and to meet needs which are now no longer felt or which are better subserved elsewhere; but I have also no doubt that the American college system will live, and, in possibly a modified form, will grow stronger and dearer to the popular heart as an essential member in a complete system of national education.

Remarks of Vice-Chancellor MacCracken.

Mr. Chancellor.— It is evident, I think, to all of us that the person who has proposed the abolition of the American college is not either of the orators of the afternoon. Somebody, we have all understood, has proposed that the work of the American college be divided and be given to the academy and to the coming university. Somebody, imitating the wise man of old, has proposed the sundering of this living child in two, and the giving of one part of it to each of these, whether they be claimants or no. It is evident, however, that neither of these papers this afternoon has supported this proposition. I would like very much, indeed, to discover who was the first proposer of this far reaching measure. I am not sure if we were to seek after him but we should find he was the same writer who very modestly proposed a short time since to abolish the organization of the American State government, and give part of its functions to the general government and the rest to the local municipalities.

Both of the papers this afternoon are willing to preserve the American college. Nevertheless they differ in that the last paper is certainly disposed to subtract somewhat from the college as it now is, and give it to the coming university, and I am not so sure but that the first paper was inclined to take from the colleges at least certain modes of training and confine such to academies. For my own part, while at a former time in my life, especially when I was a student over in Germany and afterwards, I was inclined, if not to dismember, at least to change greatly the American college. I have now come around to an almost ultra conservative position respecting our American college as it is popularly understood. The American college, as it is, stands out a distinct ideal as clearly as the central arch of yonder gallery stands there between the two arches on either side. I approve the separation of the college from the academy. Unlike the first speaker, I would not have it differ greatly in its first two years, as to methods of teaching and of drill, yet I do like the separation of the two as to locality and as to faculty. When I was called to the headship of a college in the city of Pittsburgh a number of years ago, I found a college of about eighty or ninety members, but overshadowed by a preparatory school of full 150 persons, and I had no greater pleasure during my presidency there than to witness the removal of both departments to an adjoining suburb, settling there in distinct buildings and with faculties more thoroughly separate from one another than they were before. This separation brings into clear view the epoch when the youth decides between a life devoted to business and a life that is to be more eminently devoted to scholarly pursuits. True, many who purpose following business will do well to go to college. I heard a succesful New York banker say recently that after taking his bachelor's degree he had entered business, beginning without capital upon the lowest round, and that if he

had a dozen sons intending to enter business, he should give each of them a college education; that thorough college training need hurt no one for business. Still there is with most men an early choice between a life of scholarly pursuits and a life of business as mutually exclusive. The separation of college from academy brings the era of choosing between these clearly to view. Then it segregates the group of boys that have chosen scholarly pursuits, and this is a second important argument in its favor. Nevertheless I would continue in the college the same methods of teaching pursued in the upper classes of our best academies. I cannot see any great difference there should be between the teaching of mathematics or classics in the first years in the college and the last years of the academy. The third argument for this separation of the college from the academy is that it exalts the academy and preparatory school, giving it new importance and new dignity. These advantages which are got by a distinct separation between the two organizations are not so well attained when the schools are in too near contact. I realized the evil of the latter when at the head of the Western University of Pennsylvania; I speak, therefore, of this matter with some feeling and some emphasis.

I differ from the second paper in that I would not deny to the college the teaching of some of those branches which in Germany, for example, are relegated to the university. I would have the colleges offer instruction in some of those branches which in the schools of the German empire are postponed as specialties to be pursued by those who have completed the course in the gymnasium or the real school. Among these branches I place mental and moral philosophy, political science, political economy and sociology. Gentlemen, the German empire is to-day as it has been in the centuries past, a monarchy, an almost despotism. Perhaps we may find the secret in part of why the German state is not like the British or American, partly in the fact that the men who have gone through the gymnasium have never been taught political science, nor trained to be leaders in the art of government.

Improvement in our teaching of the classics is to be made not by changing the plan of our colleges. It is to be by sending our boys at an earlier age to the classical secondary schools. The German puts his boy at Latin when perhaps ten years of age. He puts him at Greek at eleven. When our academies put boys at Latin at ten and at Greek at eleven, and there are some secondary schools, I am glad to see, that promise this, then we shall not need in our colleges more than the two years of Latin and Greek, that are now given. To devote a considerable portion of our college course to instruction in ethics, and in politics to anticipate, if it be anticipating, some of the branches which are given in the German university, instead of working any hardship to the American university, that is to be builded, will in the end greatly elevate its standard. The trouble to-day with some of our colleges, as has

well been said, is a restless anxiety to build up the university even at the risk of destroying the college. For my part I am willing to wait 100 years for the university. I do not expect to see it in my time, even if I live for another half century. I do not believe we ought to expect to see it before. We do see the beginnings of it now in those corporations who are willing to build the foundations of the university upon the American college as it is. The American college must adhere to prescribed courses in language and literature, in mathematics and the natural sciences, in philosophy and history, so far as concerns the elements of these branches of learning. When we do this, Mr. Chancellor, I believe that then we shall attain all the important objects that have been well set forth in these two papers that we have listened to this afternoon. I cannot find that I differ from the chief propositions set forth by these two papers. When it comes to the question, however, as to whether we are to have the American college, as I have defined the American college; and my definition of the American college is the ideal that is substantially accepted in this country, then I am for the college as it now is, and I believe we shall just about as soon abolish the American State, the link between the municipal and the general government, as abolish the college as the link between the preparatory school and the university. The American State has grown up here in our country, and it solves the great problem which Great Britain is so painfully, so fearfully trying to solve to-day; we have solved it by maintaining, as distinct organisms, the State, the nation and the municipality. So, in God's providence, I believe we have solved the question of what forms of schools are best suited for the training of American scholars and citizens — first, the preparatory school, whether academy or high school; second, the college, where each student, whether he is to be clergyman, physician, lawyer, teacher, journalist, business-man, or what not, is obliged to receive training in general learning and especially in philosophy, politics and history; and third, the university for the advanced and exhaustive study of every branch of liberal or professional learning.

I have seen in a recent report of the United States Commissioner of Education that we have in this country exactly 365 organizations deserving to be named colleges. Let me express my firm belief, Mr. Chancellor, we would just as soon abolish the 365 days in the year as abolish these 365 American colleges.

REMARKS OF WARDEN R. B. FAIRBAIRN.

Mr. Chancellor.— I do not intend to discuss the subject before the Convocation, which would be impossible in the five minutes which are allowed by the executive committee. But I wish to express the pleasure which I have derived from listening to the two papers which have been read to us this afternoon.

It did appear to me, a short time ago, that the colleges were receiving a very great deal of injustice in the discussion which is now carried on in regard to university education. It arose, in a large measure, from the fact that some of the large colleges were aiming at being universities. The office of a college we have had this afternoon very clearly and distinctly brought before us in the paper of Professor Williams of Cornell University. It is now coming to be acknowledged that some of the colleges are aiming at being universities. Such, President Dwight, in his inaugural address at Yale college the other day, acknowledged to be the aim there; and he promised his efforts, in the future, to convert that institution into a real university. Such, also, has been the case at Harvard College. The large colleges have gotten into a position which is neither an undergraduate college nor a university. They stand between the two. In the department of philosophy and in the department of classics, they have risen into this position, and in this way they are doing great injustice to the colleges of the country; and at the same time they are not doing the work of a university. The new president of Yale promises to carry his college up to the standing of what has this afternoon been described as the work of a university. I am glad to know this, and wish him all success. It will leave the college to do the real work which belongs to it.

Of course, I do not wish to repeat what I have heretofore said, but I think that Professor Williams has brought forward with emphasis and clearness the thought which I attempted to put before the Convocation three years ago. I then said that the college was an institution for education, for bringing the powers of a young man into conscious operation. We lose sight of the distinction between education and information. It was the province of the university to take the young man who had been educated in a college and had received a bachelor degree and give him instruction in one of the four faculties, philosophy, theology, medicine or law.

I offer my congratulations to those gentlemen who have read these papers this afternoon, because I think they have placed before the country clear views on this subject. I think that they are thereby doing an essential service to the college. We must bring the college to its real work and keep it there. It is not to ape the university. It is to prepare man for entrance to the university. And the university should not attempt to do the work of the college, but should keep to its province, to give to the educated young men, who come up from the college, instruction in the four departments, philosophy, theology, medicine and law.

Remarks of Principal E. H. Cook of Potsdam.

Mr. Chancellor.— Sometimes the common school masters think on these things, although they are not within the lines of college work. I apprehend, sir, that one of the great difficulties in this

question is settling not the place of the colleges, because as so ably set forth in the first paper it is settled in the hearts of its children, but in settling the place of the university. The young man comes from the preparatory school and the question arises where shall he go to finish his education, as we say. The universities, so called, open their doors to him on precisely the same plan as the average college does. And he is very much like the man who in the political convention moved that they should have seventy-five vice-presidents, and when they asked him what he wanted seventy-five vice-presidents for, he said it looked big on paper and it didn't do any harm. And so the average young man likes to graduate from a university rather than from a college, they being on the same plane of admission. There is a spirit of unrest growing on the part of the colleges because students are drawn away from the colleges to the so-called universities. The difficulty of the question we have before us is: Is the university a place of preparation? And we draw the line there. I enjoyed the paper, as I always do the papers of my old friend Williams. I rejoice to hear him stand on that good ground this afternoon. We want these universities to say, you cannot come to us until you have done the college work. Then the line will be clear and distinct. But when they say we will do the work of the academies and high schools, then there is a feeling of unrest and a feeling of chafing, a tendency to go outside of the legitimate college work to offer some inducements to keep these pupils, and keep them from going to the universities. I think the difficulty is there.

Remarks of Inspector C. E. Hawkins.

Mr. Chancellor.— I hesitate about taking the time of the Convocation, but I have been very much interested in the discussion. As practical educators, no more important subject can come before us for discussion than the logical relation of the college to the secondary school on the one hand, and the university on the other. I desire to bring out more emphatically the position or statement of Dr. Williams in his paper in regard to elective studies.

If I understood him correctly, he deprecated the tendency of the day in placing in the curriculum of our colleges certain elective studies. It seems to me that in considering this subject we should consider it, not only in its relation to the higher courses of study laid down in the university, but in its relation to the secondary school. The paper stated that we should spend one-half of the time in the study of the ancient languages in order that the graduate from the college may enter the university well prepared. If we consider the college course as only preparatory for the university, this may be well, for the study of the ancient languages is necessary to enable the student to think philosophically and to enter into the spirit of the advanced studies of the university course. But we must, as educators, consider the necessities of the day. While a thousand enter the academies and graduate there, only one hundred

of the thousand graduate at the college, and only ten of the thousand graduate at the university.

The question that occurred to me is, shall the curriculum or the logical place of our college be determined by those who should go there and graduate at the university, or shall we take into consideration this other element; the number that is to be benefited? It seems to me, then, that I would not deprecate the tendency of the educational interest of the day in placing certain studies in the junior and senior year of our colleges as elective studies, in order that we may accommodate the greater number that only graduate at the college.

That is all I desired to speak about. For I understood the essay to deprecate the idea of elective studies and to advocate the devoting of one-half of the time to the study of language, and only one-fourth to that of science, and including under science, if I understood him correctly, civics, psychology and natural science. It seems to me, then, when we consider the number to be benefited, that I would not deprecate the tendency of the day in giving or placing these studies as elective studies, to those that may never take the third course in the university.

Remarks of Principal J. E. Bradley.

Mr. Chancellor.— When we have present with us so many representatives of colleges, I do not feel like occupying the time that more properly belongs to them, but I heard a remark from a judge of the Supreme Court of Illinois, two or three years ago, the substance of which was that whenever a graduate of a certain college came before him in the management of a case, that he was able by the process of this man's thought and argument to discover the fact that he had received his education at that institution, and that he seldom failed to find that these men carried their cases successfully. That was one of the smaller colleges, a college whose president possessed great power of inspiring his graduates, and it has given me this thought, that in the appointment of professors in our colleges in late years, there has been some tendency to drift away from the old idea of appointing one who would best inspire students to accomplish the work of life and give them high standards and ideals, but to appoint rather men of great erudition, men of superior scholarship, but not able to give this power of personal inspiration, and too often men who are not able or not willing to interest themselves to much extent in the habits and character their students are forming. I do not know that I am correct about this. I certainly hope not, and I simply throw out the suggestion.

I arose to call the attention of the Convocation to the fact that we have a visitor with us this afternoon who has had the kindness to come a long distance to address us this evening, and whose engagements will not permit him to be with us at the conference of college presidents, and I therefore hope that he will join in the present

discussion. I am sure that it will give us all great pleasure to hear from President Hyde of Bowdoin College.

REMARKS OF PRESIDENT W. DE W. HYDE.

Mr. Chancellor.— I remember one morning when a student at the academy coming down to breakfast and finding the hash — quite a staple article of diet in academies in those days — had been tampered with, and on investigation the cause of the difficulty was traced to one man who had put vinegar into it. The principal called him to account and asked him what he meant by such a procedure as that. Well, he said, "I am so interested in chemistry that I wished to see whether the vinegar had a greater affinity for the meat or the potato." We thought his interest should not have been sufficient to insure our losing our breakfast, and I should be very sorry, as a result of this difference we are discussing, that the scholars had a greater affinity for the university or the secondary schools, and we should lose our colleges. I believe the college has a definite work to perform, which neither of these by any possibility can do. The gentleman who preceded me has expressed my views of the subject exactly. At our own little college seventy per cent. of all the graduates of that college have gone into professional life, seventy per cent. of all those who graduate. Now that seventy per cent. of those men are to be considered by themselves. It would be a gross perversion to consider the college with reference simply to the very few, to the extremly few who can go on and take a university course. I should expect to see ten per cent. of every class from this time on go to the university studies. I should be sorry to see any class turn out a less proportion than that. I do not expect to see more. Out of a class of forty not more than four men would be found on the average who would find it worth their while to spend time in the special studies of a university. Therefore it seems to me the college must have a certain degree of election, while this small number go on in special learning. One man develops a great power in the learning of philology, another develops power in chemistry and so on. There must be a chance to take these men and give them an opportunity to develop so they can go into the universities which live by the men that come out of the larger colleges. That is the elective system. It is for their benefit, and so the elective system must be worked for the benefit of the few who are to go on to the university, and the general curriculum must be worked for the many who are to go out into life. Let these men go into chemistry and botany; let the men who go into law study history and economics, let others study psychology and ethics. And let us remember that ninety per cent. of our graduates are going no further than the colleges, and they must be considered primarily, while the other ten per cent. must not be neglected.

Remarks of Professors. S. G. Williams.

Mr. Chancellor. — I will avail myself of the opportunity that you have given me, simply to clear up two or three points. I am very much obliged for the kind language my paper has called out. It was put forth, as you can see, with a full recognition of the value of the work our colleges are doing and with the purpose of recalling them as sharply as may be to what the real nature of that work is. The objections that I raised were rather incidental, they are objections to the striving after university characteristics and to the elective systems. The latter is to be taken up to-morrow in another paper, and it is hardly worth while to go into it here; but pray observe that while I profess my profound lack of conviction of the expediency of the elective system, I put the chief burden of objection to it upon the economic ground that the college needs to consider well whether it can afford the educational equipments and the educational care and expense for these equipments before it goes into the work of adding very considerably to the number of elective studies. I think that was the real point I wished to make in the paper I have given this afternoon. With regard to the stricture that was made in relation to studies, I think that if the paper is looked well to, it will be seen that there is a sufficient amount of play given for colleges. One-half time was demanded for languages. I believe that one-half is needed for languages. I do not mean Latin and Greek wholly; in the scheme I have drawn up and carry in my pocket in regard to it, I would put in a certain number of hours a week in German or French, taking the place of Latin and Greek. I wish to call attention to the fact that if Greek and Latin are to be taught at all they should be taught to such an extent as to be thoroughly mastered by the pupil. If a man is going into the ministry, or law, or any other profession, he will get more advantage from a thorough training in some one thing than in turning aside from that and learning a little in matters which have a more immediate reference to his profession. Then in regard to the matter my learned friend criticised, and so very gently that he pleased me, while he criticised as to the amount of time required for language, and in which he thought the schools below the colleges ought to do more. I wish they might. I said distinctly in my paper that the elementary schools ought to give at least two years to Latin; thus Latin would commence at twelve, so that the boy who enters the high school at fourteen would be two years advanced in Latin. It is possible that eight years of Latin may do the same for our boys that nine does in Germany, France and England. Our boys are possibly brighter and may do more. But when we find a German young man emerging from the gymnasium, able to speak Latin not only, and to read it fluently, but to absorb a good deal of the literature, while the men who go through our college course are still digging with the dictionary, and even with the grammar, to find out the meaning of authors as simple as Cicero

and Cæsar, we shall see a great deal of difference not only in the time consumed but in the animus of the work. It also seems to me that the colleges should so arrange their language work as to insure a fair mastery of what has been begun in the lower schools. If eight years are required for such mastery of Latin, and six for Greek, and the lower schools at present can give no more than four and two, respectively, to these languages, then the college should give to them the requisite additional four years. I assigned a little less than one-fourth of the time for natural science. The real amount was three hours per week in the first year to botany and physiology, three in the second year to physics, the same amount in the third year to chemistry, and in the fourth year civics for six months, four hours a week, and psychology as a science of observation for the remaining six months. This, I think, makes a very respectable course in science. Two hours a week was the course proposed for history, which, I think, ought to be studied more thoroughly than it is in our colleges. So far as mathematics are concerned, with all due deference to my colleague, I would not have anything beyond algebra, geometry and trigonometry taught in our colleges or secondary schools; but when a boy left college, I would have him so trained in these that he should not break down on the first simple problem involving quantities beyond the second degree. I would have him so understand geometry that he could not merely demonstrate the various propositions of the various editions of Euclid, but that he, himself, should be able to demonstrate original propositions. And so with his trigonometry. Better algebra, geometry and triognometry so thoroughly taught that a man is able to use them all through his life and know them, than the attempt to go through a great mass of analytical geometry and calculus and some other higher mathematical subjects, while really nothing of algebra and geometry is so mastered as to make them useful. More discipline may be gotten out of these thoroughly learned than by wandering over a great wilderness of studies, and coming out from the wilderness more bewildered than upon entering it.

REMARKS OF PROFESSOR O. ROOT.

Mr. Chancellor. — I desire to call attention to one or two points. There seems to have been a substantial agreement between the thought of my successor and myself in giving an affirmative answer to the question as to whether the American college has a place in education. Where we differ is in the matter of co-ordination.

I have the very highest respect for the three-fold plan in the American system. I do not mathematically believe in the fourth condition of matter, but I do not know why all stools should be three legged. I do not see why we should be bound down to the three-fold classification. Because our German cousins across the

water have Volkschule, Gynasium and University; because our nearer cousins across the water and the channel have dame school, public school and university, because there is childhood and youth and manhood; therefore, we must have primary schools, secondary schools, tertiary schools — stop.

I do not conceive that there is an absolute necessity for carrying on everything as has been advocated. I do not know why the quadruple is not likely to come just as well as the triple. I am entirely in accord with my friend as to most of his notions, but I see no reason why there should be a single class of secondary schools, and then, as subordinate in the classification, the high school and the college. I would take the four-fold classification, the primary school, the secondary school, the tertiary school, and I would not be afraid of a fourth, still higher school. Otherwise I can agree with the professor of pedagogics from Cornell. So far as mathematics are concerned, I would not worry if I had less work in our Hamilton College curriculum, yet I should dislike to leave things as lop sided as they would be if we stopped where the professor suggests. I rather congratulate myself upon the fact that I have flanked the faculty of Hamilton College. The faculty made the "calculus" *optional.* I teach in algebra what is called the infinitesimal analysis. What the faculty call calculus; what forty or fifty years ago was the bugbear of the schools has become the familiar implement of the primary schools, and the long tortuous paths of demonstration, which I learned years ago, have been smitten through by the modern analysis we call calculus. It is no longer a bugbear, it is a facile matter. I propose to teach it, and I do teach it to the Hamilton College freshmen. I think I should manage in some way to flank the faculty of Hamilton College if they made analytical geometry an elective study. I know that the old fashioned study called geometry is not geometry as understood in these latter days, and I cannot draw the line and build there a fence between the ancient and modern geometry. It can't be done. Nor can I teach trigonometry as it ought to be taught without some notions of co-ordinate geometry. I don't propose to teach nor should any college propose to teach all mathematics. We should open the doors that lead to the pathways along which I should be proud to see our universities lead our young men. I am not one atom ashamed to stand subordinate to the American university. I should be glad to sit at the feet of Sylvester, Cayley and Newcomb. If it only be that it requires the degree of Bachelor of Arts let the university come anywhere — I do not care when nor how. I do not care from what germ it sprang nor by what name called, let it come. A university, if it makes these demands, whose facilities are so much greater, whose realms are so much sweeter, whose trumpet call is so much more a bugle inviting to these fields of conquest, let it come anywhere, and I will stand in Hamilton College and say God speed to that university, and God speed to the young

man who enters it. I am not ashamed to do preparatory work I have done it in the public schools, I have done it in the academy I am willing to do, am trying to do it in the college. It has been only preparatory work at the best through all these years, before the university was dreamed of in America. Our scholars in the past, President Hitchcock, Edward Robinson and James Hadley were prepared for their work in college halls. We are only preparing men for their daily life work. We have been doing only a preparatory work from the first. I should be glad if the American university — taking its sequent position without any rivalry with the little colleges that are willing to do their own work — if the American university shall lead our youth towards a more generous education, higher and higher up the heights of scholarship and thought.

VI.

THE ELEMENTS OF KNOWLEDGE — THEIR NATURE AND ORIGIN — A NEW SOLUTION OF AN OLD PROBLEM.

By Prof. W. D. WILSON, LL. D., of Cornell University.

From the earliest days of human history, questions concerning the origin, nature and extent of human knowledge have occupied a conspicuous place in the speculations of thoughtful men. As early as the fourth century, B. C., Plato proposed his famous theory of ideas. Considered as *pre-existing*, they were the patterns, models or ideals after which all things were made; considered as *embodied in the outward world*, they were the essential properties or essence of things; considered as in the mind, they constitute the knowledge we have of things. But aside from the difficulty of comprehending this theory, it was never fully accepted. Aristotle regarded these ideas as mere "fictions," and all through the Middle Ages we have the Nominalists, who dissented from Plato's doctrine of ideas.

In 1641 Descartes inaugurated a new movement. He considered ideas as constituting, indeed, the sum of our knowledge, as others had done before him; but he thought that a part of them, or at least the elements of a part of them, are derived from the objects in the external world by sense-perception. But, besides the adventitious ideas which represent material things, he held that there were some innate ideas and another class which he called "factitious." These ideas are created by the mind itself out of matter or elements furnished from one or the other of the two sources indicated, and represent only fictions.

Descartes' recognition of elements of ideas derived from external objects by sense-perception, however, did not form a conspicuous part of his theory, and was almost wholly neglected both by himself and by his disciples and followers. And we have the idealism of Malebranche and the pantheism of Spinoza, both as logical inferences and as historical development.

In 1690 John Locke published his now famous "*Essay on Human Understanding.*" In this essay Locke denied the reality of innate ideas, and taught that all the elements of our ideas — "the matter of them" — are derived in acts of actual observation of objects that really exist, and are of two kinds or classes. The one class or part is derived by sense-perception from external objects, and the other part from the mind itself by consciousness and reflection upon its own acts and states.

From sensation, as Locke says, "we come by those ideas we have of *yellow*, *white*, *heat*, *cold*, *soft*, *hard*, *bitter*, *sweet*, and all those things which we call sensible qualities." From reflection, or consciousness, as we should say, are derived the ideas of "*perception*, *thinking*, *doubting*, *believing*, *reasoning*, *knowing*, *willing*, and all the different actings of our own minds; and we do from these receive into our understandings as distinct ideas as we do from bodies affecting our senses."

Locke says, also, in regard to these ideas of our inner nature, we get them as "the mind is employed about the ideas it has got" from sense-perception — that is, we are conscious of "the operations of our mind" when we are reflecting upon those ideas.

But Locke himself does not appear to have fully appreciated the last-named source or class of ideas, consciousness of the mind's own acts and states. He makes scarcely any use of it in solving the problems which he discusses in his attempt to show that his theory is adequate to an explanation of all the facts in the case.

And in this he has been followed by both disciples and critics; and we have the idealism of Berkeley, the scepticism of Hume, and the atheism of the French Revolution, as legitimate results.

In Scotland, Dr. Thomas Reid published, in 1785, his "*Essays on the Intellectual Powers.*" In these essays he occasionally alludes to, but makes no practical use of Locke's suggestions, concerning "the perceptions which the mind has of its own actions, and states." He fell back on the ground of common sense, or sentiment, and insisted upon the fact that all men *do* believe, and from the very constitution of their nature *cannot help beleiving*, that we perceive the objects of the material world immediately, and without the intervention of ideas, or idea-images of any kind; and that on the same ground, and of the same necessity, we believe in the realty of our own minds and the freedom of our wills, and the existence of God, as well as in the first principles of moral obligation and of religion.

It is indeed true that Reid, in one place at least, recognizes, or claims rather, elements of our ideas of things that are not derived from sensation. He says (Ess. II, chap. IV, § II) "the child sees the jack, and every part of it, as well as the man; the child has, therefore, all the notion of it which sight gives, whatever there is more in the notion which the man forms or it must be derived from other powers of the mind."

But by other "powers of the mind" he does not mean what Locke had included under the head of reflection, or consciousness; for in this case the other elements must, of course, consist of sensible properties, since no one ascribes to the jack, the object spoken of by Reid, any of the forms of mental activity, or anything else that, in Locke's view, is to be learned by the observation of our own mind, by consciousness. Reid can, therefore, hardly be understood as not implying or claiming, by his assertion, something of the nature of innate ideas.

And those in our country, as well as in Scotland and England, who are not content to follow the mere sensational theory of the origin of ideas, and acquiesce in the agnosticism of Sir William Hamilton, Dean Mansell, Herbert Spencer, and such like philosophers, generally find the necessity of some such element, and are inclined, for the most part, to call them *intuitive* ideas. But the expression is indefinite — illustrated by no accepted or well known fact, and is, moreover, really about equivalent to saying we must have something, we know not exactly what, to save us from agnosticism or its cognate and practical equivalent, atheism.

In 1781, Kant began, in Germany, another effort to counteract the skepticism and agnosticism which had resulted in England and Scotland, from the way in which Locke's theory, or what had been named as his theory, had been accepted and applied. He coincides, however, with Locke's principles, too far to allow his effort to be successful. He recognized only the elements of ideas that are derived from sensations; and he entirely overlooked the fact that those elements are obtained only by cognition of the objects themselves. And he like Reid fell back on "the Practical Reason" for his principles of morality and religion.

So far as the external world is concerned, and, in fact, in regard to all *objective* reality, Kant reached a scepticism as complete as that of Hume. And we have, following him, Fichte, who reached an idealism which is, in most respects, like that of Berkeley, who followed Locke, and Hegel, starting with the assumption that thought or ideas are the only reality, proceeded to develop what he called a logic, which was at the same time an ontology as well. But this German movement, from beginning to end, from Kant to Hegel, overlooked and neglected one of the fundamental facts in Locke's system, namely, that all the elements of our ideas are derived by and in the very act of observation of the objects themselves which they represent, and thus, of necessity, imply the reality of those objects.

In 1829 Victor Cousin, seeing the failure of the German movement, and the consequences and developments of what had been accepted as Locke's theory everywhere prevalent, undertook, in a review of his essay, without, however, correcting the prevalent misconception of it, to point out what he regarded as its defects, and to show that, in order to remedy the evil there, he recognized certain *a priori* elements of knowledge, analogous to, if not the same as, the innate ideas of Plato and Descartes, and thus virtually set philosophy forward again on its old track towards absolute idealism, though it was not his intention to do so.

From Locke's statement and the examples he gives of the ideas we receive, whether by sense-perception or by consciousness, it is manifest that all simple or elementary ideas must be denoted by *abstract* terms; and that no one of them can denote a real object as it exists, whether as a material object in the world around us or the mind within. And, further, that the mind by one or

the other of its forms of acting, combines and compounds these elements into the ideas which we have of things, and which are denoted by *concrete* terms.

Take, for example, an orange. The *idea* of it is a complex idea, in our view of the subject. It is made up of elements that enter the mind through at least four distinct channels, sight, touch, taste and smell. But once having the idea, we can recognize an orange and re-form the idea by the exercise of either one of these senses alone, or, in fact, by imagination without them.

So, too, with the mind. The mind is not reason, or memory, or will; but it is that unseen, immaterial substance within us which wills, remembers, reasons, etc., the idea of which we get immediately by consciousness of the acts and states of the mind itself.

But in each and both cases alike, the elements of one class of things are ideas of mere properties, acts, modes or states of things, which we make into the ideas of the things, and not the ideas of the things themselves. And these elements, Locke holds we derive only and exclusively from the objects themselves by acts of cognition in sense-perception and in consciousness.

Locke is very confident in his proposed solution of the problem and very emphatic in asserting it. He says: "The understanding seems to me not to have the least glimmering of any idea which it doth not receive from one of these two. External objects furnish the mind with the ideas of sensible qualities, which are all those different perceptions they produce in us; and the mind furnishes the understanding with ideas of its own operations;" "these," he adds, "when we have taken a full survey of them and their several modes, combinations and relations, we shall find to contain all our whole stock of ideas, and that we have nothing in our minds which did not come in one of these two ways."

These statements occur in the earlier part of the essay (B. II, c. 1, §§ 3, 4 and 5), and the remaining part of the essay is devoted to an explanation and verification of his theory. I think Locke was right in his starting point, and it will serve to give us a more adequate estimate of the importance of this subject if, before coming to the precise discussion of it, we take a glance at some of the developments that have resulted from the misconception and misapplication that has been made of what has been called "Locke's system."

Hobbes, before Locke, had denied innate ideas, and professes to derive all ideas from sensation alone, and we have his materialism, his absolutism in state, with the undermining of all religion and generous morality. In this half-form, Locke's system was not different essentially from Hobbes'; and we have the modern agnosticism represented by such men as Huxley and Herbert Spencer, with a total undermining of morality and a scoffing at religion — at all forms of worship and all the noblest sentiments of humanity and philanthropy.

In Germany the course of speculation has been peculiar. Kant, arguing expressly and avowedly for the purpose of counteracting what he saw around him, and regarded as a result of Locke's philosophy, really took Locke's principles as his starting point, and derived all the elements, "content," of our ideas from sensation. But he neglected the fundamental fact that, as held by Locke, even this class of the elements of our ideas are derived and can be derived only from external objects, by and in acts of actual cognition of the objects themselves — the mind, as he said, furnishing *a priori*, their forms or *schemata* making the elements into the ideas of things which he called their phenomena; and these phenomena or ideas are, in his view, the only things that we really know. Of the things themselves we know nothing; not even that they exist. And thus we have a starting point, which, though arrived at in a different way, was the same as that of Plato, and soon led, in Hegel, to a form of idealism, egoism, monism or pantheism as unintelligible and as utterly inane and useless, for all practical purposes, as that of Plotinus and the mediæval mystics, John Tauler and Jacob Boehme.

And this all comes from the error at the start, of overlooking the fact that all the elements of our ideas come by actual cognition, and cognition implies the substantial reality of the thing cognised, and cannot take place without it. The practical conclusions to which the attempt to derive all ideas from and limit knowledge to the elements derived by the senses are manifest and well known, materialism, atheism or — in its more negative and cautious form — agnosticism. The practical evils of the other extreme, however, are not so obvious, and, perhaps, not so bad. That system starts with the fact of thought. It makes but little if any difference in the result whether it be "*the innate ideas*" of Plato, "the *phenomena*" of Kant, "the *concepts*" (*begriffe*) of Hegel, or "the *a priori ideas*" of Cousin. In all cases, and alike, the method from that starting point leads to a neglect, if not a denial, of the substantial reality of the external things that make up material nature, and to the rejection of all objective authority in matters of morality and religion, and in politics as well. It is the parent of the rationalism in German theology, and, as I doubt not, also of the "socialism" and political disorders among the lower classes. *It takes away all idea of objective authority*, and without this there can be no idea of submission and obedience, whether in Church or in State, in matters of morality or of politics. And thus extremes meet, and, as with Hobbes and the agnostics, we have religion and worship as but a superstition and a weakness, and in the state there is no legitimate authority; it is only "might" that "makes right," and all claims to loyalty are but a sham and a pretense. The doctrine virtually makes each man, for himself, his own conscience and his own God, and hence any claim or pretense to preserve order and promote the public good is but usurpation and tyranny, which they

have a right to resist whenever they can, and by any means in their power, as best they can.

Of course it is not supposed that the masses of the people have ever studied Hegel's writings or know anything of his philosophy as such. But the theologians who deny the genuineness and authenticity of the books of the Bible, have studied it, and have derived their rationalism from the principles of his philosophy; and the masses have learned enough of it to believe that there is no personal God, no moral governor of the universe, no legitimate authority of one man, or of any society of men over another man anywhere, and that each one is at liberty to do as he pleases — do "what is right in his own eyes," or leave it undone and pursue a different course as he may feel disposed.

It is true that we have now men of an intermediate school, who, like Reid and Stewart, stop short of and stoutly protest against the materialism and atheism, or agnosticism, as the more cautious and prudent men of modern times prefer to call what has been deduced from what was assumed to be and used as "Locke's Philosophy." Among the men who occupy this position are the names of the two honored and distinguished presidents of Yale and Princeton Colleges, respectively, Drs. Porter and McCosh, to mention no others of less distinction. In fact the active and strong common sense of our American mind, like that of the English and Scotch, holds back these men and the great mass of our population from the extremes, which logic deduces, and which history is sure, sooner or later, to develop into some practical manifestation from any system of partial or unsound premises. But this teaching, which passes for philosophy, and which is accepted for its great practical value, I cannot regard as being, after all, anything more than a temporary expedient, which can last only while humanity is waiting for something which is both systematically complete and logically consistent, at every step, from previous and primary facts, to its remotest conclusions, *so* systematic and logical that it will be accepted as a *science*, and bring agnosticism and mysticism alike to their appropriate end.

I am not aware that any successful attempt has been made to solve the difficulty. Hardly a serious attempt has been made at all. One school, accepting the doctrine as a starting point that all ideas come from sensation, end *now* in what is called agnosticism. They repudiate atheism, and limit — as their psychology requires them to do — knowledge — word and thing — to what we gain by sense-perception, and of course, therefore, to the material objects of time and space — what we see and can handle in the world around us. They not only declare that this is the limit of knowledge, but they expressly avow its principles — a principle of action both for morality and for religion — that "the knowledge thus within our reach is the only knowledge that can be of service to us."

In the other direction, the material world becomes an unreality. Not material things now, but thoughts, ideas and conceptions are all that we know or can know — they are the sum and substance — the sum total of knowledge; even the objects that we suppose to be in the world around us are but our own thoughts, projected by our own minds by a sort of magic-lantern operation into a state of "temporo-spatial disjunctivity."

I have intimated that one-half of Locke's elementary ideas have been overlooked and neglected, and that his fundamental point that all ideas are acquired in some act of actual cognition of an existing substantial reality has also been ignored. And I think that his theory, when properly understood and applied, is nevertheless the right one. And this I proceed with my attempt to show.

In the first place, I assume that all knowledge, all belief, and in fact all thought, is to be considered as made up of what we call ideas. In this connection I neither assume nor deny that ideas are realities in the mind, as Plato held, rather than mere fictions, as Aristotle, Reid, Cousin, and many others have declared to be their belief in regard to them. For my present purpose it makes no difference whether they are the one or the other.

In the next place, we must consider that just as the material universe is made up of objects that are endless in number and variety, which, however, can be reduced, by analysis, to a very few elements, some sixty-four or five, I believe, so knowledge is considered as made of ideas. And as every idea of a thing or real object is made of several elements or elementary ideas, so all knowledge — that is, all our ideas of things — can be reduced by analysis to a comparatively small number of elements; and these elements, as I hope to show, belong to one or the other of the two categories or classes named by Locke as obtained from material objects by sense-perception or from the mind by consciousness.

It is, indeed, true that we cannot now name or enumerate these elements of our ideas as we can the elements that the chemists recognize, but we can do as a chemist must be content to do, we can define them as those that admit of no further analysis.

It is, however, quite possible that many of the ideas we thus get are, when we get them, complex in a most important sense. Take the ideas of such colors as gray, orange and green. One who has never *seen* a white object cannot imagine one that appears to us to be white. But I presume that a person who had seen two objects, one black and the other white, could imagine a combination of the two colors; that is, he could imagine an object that is of a gray color. So with orange; it is a combination of red and yellow; green is a combination of blue and yellow. And we can often see objects that are gray, green or orange colored, and we get these complex ideas — if, indeed, they are to be regarded as complex — by a single act of sense-perception; the same thing may be true of the ideas we get by the other sense-organs and by consciousness as well.

It is readily conceded that Cousin has shown that there are and must be, in our knowledge or ideas of things, elements that cannot have been derived by sense-perception from external or material objects. But this Locke also maintains, and names as a second source and class, those that are derived by consciousness from an actual cognition of the mind itself, its states and acts within us.

But Cousin is faulty in two respects: (1.) He neglects this last named source of the elements of ideas, and (2), he takes for his illustrations and tests only complex ideas and not the elementary ideas themselves.

I begin with calling attention to the fact that the mind is all the time performing the act of synthesis by which these complex ideas are formed out of elements that are already in the mind.

I see an object before me; it is an orange; but I get some of the elements of my idea of it, its color and form, for example, by my eyes. I get others by my sense of touch, as roughness, hardness, etc., and others again by the senses of smell and of taste. Or, suppose I am reading of an object I have never seen, I put the elements of the idea-image which I thus get of it together, sometimes unconsciously, and sometimes, not without a good deal of conscious effort and difficulty. In this way I get an idea of what the author was describing or thinking about. But it is a complex idea.

There is, however, a limit to this power of mental synthesis. If I am blind, I cannot include in my idea of anything, as an orange, its color, whatever it may be. I cannot, in that case, imagine how it looks. And so of the elements derived by each of the other senses, I cannot supply them by any voluntary effort of my own.

Or, again, there is an animal on the floor before me; it is a dog, we will suppose; I think he sees me, loves me, understands what I say; remembers me when I return after an absence, etc. But if I had had no consciousness of the processes of sense-perception, understanding, remembering, etc., in myself, and in my own personal experience, I could never have supposed or even thought of these mental acts as being performed by him, any more than the blind man could think of his color, or the deaf man of the sound of his bark.

The words selected as tests by Cousin are seven in number: space; time; substance; cause; personal identity; good and evil; and "the Infinite" or God. He claims that all persons have ideas of these things, that is, have thought of them or think about them. And this, of course, we cannot, or, at least, we need not deny. But considering our thoughts about them as ideas in the mind, the question is, how did we come by these ideas? The question is, not what has led or may have led us to think of them. These are what Cousin calls "the occasional causes" of these ideas. But the question, and the only question, so far as the issue before us is concerned, is, what do we think of those things; or, what are the properties that are ascribed to them; or, in other words, what are the elements of the ideas we have formed of their objects?

Go through with Cousin's discussion and we shall see at once, if we keep this point in view, that we do not ascribe to any one of the seven subjects named any property, the idea of this may not have been obtained in one or the other of the two ways named by Locke.

It is, indeed, true, as Cousin claims, that no one has ever seen or handled either space or time; so that in this sense and *as complex ideas* they are undoubtedly *a priori*, in the only sense we can attach to these words in this connection. It is also indeed most probable that the two named, time and space, are pure fictions; and so have never been seen by anybody. But at any, rate we ascribe to them no property that we had not gained in the perception of real objects. Space is extended; and we say, so, too, is this table — and every other material object that we ever see. Time lasts or endures; so does this paper which I am writing upon.

With regard to the word "*substance*" we use it in several different senses. Sometimes we mean the solid part of a thing that lasts through changes in its accidents and surrounding. And sometimes we mean a something that has no properties in itself — but merely "underlies" all properties and serves as their ground or possibility of existence. But in either case we ascribe to substance no properties but such as we had seen in either matter or mind.

Now it seems to me that we can account for the origin of these ideas very easily. I see two objects with nothing — nothing that I can see — between them and call that distance space. This, I suppose, to extend infinitely, and having no other property, it is invisible, and so without form and may be said to be infinite and surround and embrace all things — very much as the air surrounds and extends beyond all the things that are on the earth. In the same way I think of the *duration* of any change, or process, or event. Abstract this duration from all other elements of the cognition, or the thought of the object, or in stricter form of expression, withdraw the thoughts from all properties but this one and call that of which I then find myself thinking, time. It, too, is infinite, and without form.

In the case of substance, in the sense of the word here intended, we arrive at it purely by a process of abstraction. We take from our idea of a thing, *all* of its properties, as we might take — to borrow Descartes' figure — the hat and clothes from the body of a man we see passing under our window to get at the real body, and call what would be left, if the process were possible, the substance of the thing. But the process is negative; it takes away properties; it adds none; consequently, there can be no element in our idea of substance, that was not in that of the body, with which we began our supposed operation.

With regard to the four remaining words, cause, person, God and goodness, the case is different. Doubtless Locke himself was at fault here, though, as I think, his system was not.

The idea of cause Locke attempted in his essay to derive from sense-perceptions of constant antecedence. Cousin shows that this solution is inadequate. But even then he accepts M. de Biran's suggestion and derives the idea from what Locke had included in his second category, "reflection," or consciousness, namely, from the acts of willing, and of effort on our part.

The idea of personal identity is merely the idea of a personal substance — a mind or soul — that endures through the various changes of thought and feeling; just as the substance of any material thing continues and endures through the changes which the thing itself undergoes. But the idea itself is obviously derived from consciousness or "the perception which we have of the operations of our own minds within us," to use Locke's exact phrase.

But what do we mean by identity, it may be asked? And where do we get the idea of identity? In considering things around us or our minds within, we soon come to feel that in some respects they change not, while in others they do change. Those properties which do not change are, as a matter of convenience, considered as constituting the essence of the thing that always accompany it. They never are and they never can be separated from it.

What we affirm, then, is identity of *substance* as contrasted with the changing and transient *forms* or *modes* in which anything may exist. In *this sense* of the word, substance is not something without properties, something that underlies and forms the basis and ground of all properties. But it is the thing itself, considered *substantially*, and by those of its properties which do not change and cannot change and leave it the same thing — cannot, in fact, change without an act which would be the annihilation of *that* object and the creation of another in its place, or possibly an act of annihilation that would leave nothing in the place of the object.

Before proceeding with the remaining two subjects I think we had better consider a little further Locke's second class of ideas and make distinct mention of its states of feeling, as well as of its acts. We know what pain is because we have felt it. So with the ideas of beauty, sublimity, duty, sense of obligation, shame, remorse and such like terms. We all use them and know what they mean, because, and only because we all have felt them.

Neither of these ideas or terms, nor in fact any of those that belong to this class, can be defined so as to be made intelligible to one who has not experienced them; any more than the ideas or terms denoting color can be defined or explained to the blind. One who has seen a beautiful object and felt its beauty knows what the word beauty means, and has the idea which we express by the word. But how did he come by it? It is not the result of mere sense-perception — for many animals who have no susceptibility to beauty have all the senses as complete as we have. It

can hardly be called a form of the mind's *acting*. It comes not from mere sense-perception nor yet from mere consciousness of the mind's actions. It does come from a consciousness of the *feeling* we have when beholding or contemplating some objects that mankind have agreed to call beautiful, just as the idea of whiteness comes when we see an object that we call white.

It is, indeed, possible to extend Locke's definition so as to include this class. But his language does not imply it. He says perception, thinking, doubting, believing, reasoning, knowing, willing, and he adds "all the different *actings* of our own minds." I think we must add the *feelings* of our own minds also.

And following out this line we get the moral and religious ideas as well. Duty, or the idea of it, comes doubtless from a feeling or sense of obligation. Our idea of remorse comes from a sense or feeling of guilt; just as our idea of worship comes from a sense of the greatness and goodness of God. A person who has had none of the feelings denoted by these words cannot have the ideas expressed by them or understand what the words mean.

I think, therefore, that we must extend Locke's enumeration, or specification rather, so as to include the consciousness of the "feelings" as well as that of the "actions" of the mind. And I think, too, that this extension of Locke's analysis of the elements or "matter" of our ideas will help us in the further discussion of our subject.

Let us take, first, the idea of "the good," or of goodness and "happiness," as distinct from what is merely pleasant and pleasure.

Cousin is, doubtless, right in maintaining "the good" is something more than merely "the pleasant," and that happiness is something quite different from, and of a vastly higher nature than, mere pleasure. But he fails to show, in fact he makes no attempt to show, that happiness is not something that we have all experienced, and that what we call good is different *in kind*, however much higher *in degree*, from what has occurred in some small measure at least to us all. It is, indeed, true that pleasure and pain have reference to ourselves merely, and the experience of these alone would not give us the additional element of "goodness;" that element which, in fact, constitutes its chief excellence. In the idea of "the good" we have reference to others and to their happiness and welfare.

Much has been said about "an absolute good," but I really do not know what the words mean, if we are to take them in their proper sense. If I remember rightly, Plato somewhere puts into the mouth of Socrates a statement to the effect that the good is relative — that that which is not good *for something* is simply, as he says, good *for nothing*, or not good at all.

At any rate, when we think of things or acts as good, we think, or have thought, of them with special reference to the happiness and welfare of others, and perhaps of all mankind, and of all things in the universe, the glory of God included.

To this method of accounting for the origin of our ideas, the idea of the "infinite" or God calls for no exception. It is not now a question of what we *know*, or what we *believe about* Him; but it is simply what attributes do we ascribe to Him? I apprehend that the closest and most careful analysis will show that we ascribe to Him no attribute which we have not seen, as a mental act or feeling in ourselves, the same in kind though not, of course, the same in perfection. We are conscious of knowing something, however little; we call Him *omniscient.* We are conscious of some power and can do some things; we call Him *omnipotent.* We are conscious of being present *here* and *now;* we call Him omnipresent and eternal. We are conscious of purpose and good motives, at least occasionally; we call Him infinitely good — good always and to all things. What we see in ourselves in weakness, limitation and imperfection, we ascribe to Him in perfection and without limit. But I know of nothing that we ascribe to Him, as an attribute of his character, that we do not see in ourselves. We idealize whatever is good in ourselves, and leave out of our idea of Him all of our weakness and our wickedness. In childhood and youth we think of Him as like the best man we know, only a great deal better. As we grow up our idea changes indeed. But I do not think we ever get beyond what I have intimated. There can be no doubt, of course, that we have ideas of the second class named by Locke—that is, ideas of our own mental acts and states. Nor can we doubt that they enter into and form a part of our knowledge — unless indeed we are content to limit the use of the word knowledge as the agnostics insist that it shall be limited — to what we gain by sense-perception. But assuredly we know that we are thinking — when that is the case — more surely than we know anything of that about which we are thinking, even its existence.

If, now, we look at children who have not arrived at years of moral reflection, we find that they not only ascribe to the objects they see the sensible properties by which they recognize these objects; but they also ascribe to them — even to inanimate objects — such feelings and mental acts as they have experienced in themselves. Hence they praise or blame and punish them as though they were conscious of what they are doing and could do otherwise.

As we pass along in life and begin to study animals and their modes and forms of acting, we begin by supposing that they have intelligence and voluntary activity like our own. Further on we begin to doubt this theory of their actions, and, finally, many like Descartes, Huxley and others, deny to them all consciousness with intelligence and voluntary action, ascribing all to instinct or mere reflex action.

If we look into fairy-land mythology and polytheism we find the same result. However grotesque, ridiculous, absurd and impossible may be the beings they talk of, we never find ascribed to them any

but such properties and acts and states of mind and feeling as we have been conscious of in ourselves — though, of course, in greatly modified forms and most distorted proportions. But they never ascribe to them any other — they have no ideas of any other. Or, finally, if we look beyond what we immediately cognize, and see as effects some phenomena that are not or cannot be accounted for by the causes which we see and can examine immediately, we always look for something unseen, which, however, is either a piece of matter, like that we know of elsewhere, or a being, thing — perhaps an animal, or possibly a human being like ourselves, in case the phenomena should be such as to call for human agency. The discovery of the planet Neptune is a case in point. The astronomer had discovered some perturbations in the planet Herschel. But he never for a moment supposed there was a personal agent causing them. He thought there was a planetary mass attracting it, and on pointing the telescope in the direction indicated he found the cause — the newly discovered planet Neptune.

So, too, in looking at the phenomena of material nature we come to the conclusion that matter is inert, can neither start from rest to motion, nor change the rate of its motions of itself. We see, also, what appear to us to be signs of plan and purpose — of wise plan and personal control in the harmony and adaptations of the objects in nature, one to another; and we are impressed with the idea of a Divine Mind, acting in and controlling all things. But it is a mind like our own, sin, weakness, imperfection and wickedness alone excepted. We know of and can conceive of no element of character not thus obtained that can be ascribed to Him besides those we have cognized in ourselves.

If now we accept the ultimate analysis of our ideas, which I have suggested in this paper, we have a new solution of this old problem of knowledge. And surely, though new so far as I know, the analysis cannot be objected to, when it is once fully understood. We know that the mind is busy, in all its waking hours, in forming complex ideas of the things that we see or are thinking of. In this activity, we for the most part, follow the examples or models we see in nature around us. But in many cases we give flight to the wings of fancy and let it roam "at its own sweet will" and form ideas of fictions that exist and can exist nowhere.

It is never easy to prove a negative, and perhaps in this case it is quite impossible to do so. But there are two or three considerations that seem to me to be of a controlling character.

It may be well, before going any further with our subject, to stop and consider a little what we are to understand by a few of the terms that must of necessity occur frequently in this discussion.

The word "innate" as applied to ideas may mean in the mind *before our birth*, as in Plato's theory, or it may mean *born in the* mind, upon occasion, as is in fact most frequently the case at present. The words *a priori*, as applied to ideas, mean that the idea exists

or is formed in the mind *before any actual observation* or cognition of the object. In this sense *a priori* ideas *of things* are possible, and in fact very common, as I think I have shown already; but *a priori* elements *of ideas* are, as I think we shall find, neither real nor possible in our present state of existence.

A word more frequently in use at present in relation to this subject is "*intuitive*" or "intuition." But the word is ambiguous and has at least three distinct, different meanings. It is sometimes used, though not often, to denote a mere act of sense-perception, as when we speak of the immediate intuition of any visible object. It often means an act of mere imagination, the looking *upon* a thing by the mind as though it were present; as when we say we see by the intuition of two straight lines that they cannot cross each other more than once, or of two parallel lines that they cannot meet at all. But finally the word often means *insight* or the seeing *into* the thing, its very nature, as when we say from an insight into the nature of any effect that it must have had a cause.

1. Now, in the first place, it is *contrary to experience* to assume that there are any elements or ideas that have not been derived from objects by some act of observation. Take the case of the blind and the deaf, the mind never furnishes them *a priori*, or by any form of mere intuition, with the ideas of color or of sound. Not even in the vagaries of their dreams or the wildness of delirium—do these ideas ever come into their minds.

Judging from what are known as the anatomy and physiology of sensation and the nerve centers, it seems not unlikely that the blind may have those nerve centers excited, as we do sometimes by a blow on the head for example, so that they, as we do, have sensations of light. But there is no sense-perception in such cases, that is, we do not perceive *any object*, and so their experience in this way does not furnish them with any element of an idea of the color of an object, or if it does, they know no language to express it to others. Doubtless, something similar may occur to the deaf, but if so it is with a like result. Sense-perception, as a source of ideas, must come in the regular way and through the appointed organs of sensation.

2. But again suppose there were *a priori* or mere intuitive ideas, we could not express them; we could have no words to denote them. How could we come by the words, if there are any, that express them? The origin of words is pretty well understood to have been something as follows: Two or more persons standing by something for which they have no name, one of them makes a noise, which thus becomes a word, and the name of that thing ever afterwards. Or if we have the word and it denotes an elementary idea, we can gain no sense of what it means except by the experience of acquiring it by actual observation. To recall illustrations, that I have often used, you can give no man the idea of whiteness by merely talking about, defining or doing your best to explain what

you mean. He must see something that is white or the words "white" and "whiteness," have no meaning for him, however innate *a priori* or intuitive they may have been. So with the feelings, pain and pleasure, the acts of willing and choosing. We can make the words which we use expressing them intelligible only by recalling the experience which the party has had of those feelings producing them in him or using some synonymous word in case we speak a language that he does not understand. Hence it appears that if there are innate, *a priori* or intuitive elements of knowledge no word could be invented and brought into use to denote them, and we could thus have neither words nor language to indicate their existence.

3. In the next place, and finally, elements of ideas or elementary ideas not derived from actual observation, whether we call them *innate, a priori* or *intuitive* even if there were or could be any, would be *no elements of knowledge;* they would be like the elementary ideas we now have under certain conditions. Suppose one of us, with ideas of all the colors known to science or art, to be standing in the dark, when the darkness is absolute, and we take something in our hands, that we do not recognize by the touch as having seen; with all the ideas of color in our minds we cannot tell, and do not know what is the color of the object we have in our hands.

And so it must be with any idea the elements of which have not been actually derived from the cognition of some object. We might have the ideas indeed, but we should have no means to express them. We could make no use of them, they would be like terms in algebra, which we cannot introduce into our equation and make them equal to others as parts, multiples roots or power of any known or ascertainable value. Hence they would always involve the possibility of denial and controversy and afford a ready means of escape from refutation or embarrassment, whenever we might happen to be hard pressed or closely cornered by our adversary.

Come to think of it in that light, I am not sure but that words of this kind do frequently occur in what is called metaphysics, and that their occurrence is the occasion and simple explanation of what is regarded as their unintelligibility. Thus I have before me a statement of Malebranche, in the words, "God is indeed extended, but the extension in Him is not such as we see in material objects." Well, what then is it? He does not tell us; he does not even call it by any name. It is much like saying to the blind man, white things are rough, but then it is not such roughness as you can feel with your hands." I confess that much of what we are asked to call philosophy or metaphysics is no more intelligible than this, and unintelligible for about the same reason as it seems to me.

In view of such language, and we often meet with it, I am frequently tempted to say, in language more curt than courteous, "Don't keep telling me what the thing is not, but tell me, if you can, what it is," and I shall be under obligations to you.

Knowledge begins, then, with the observation of facts or real objects (1) by sense-perception for objects in the outward world; (2) by consciousness for the mind within.

It must be understood, however, that knowledge is not limited to observation and observed facts; though all the elements of knowledge are obtained from this source. But in mathematics, for example, we can prove many truths and facts that never have fallen under our observation and never can. So, too, in the sciences that deal with facts, we can prove by demonstration that many things have occured the likes of which no man has seen. The beginnings of life, animal and vegetable, on this earth are cases in point. These facts can be said to be known as truly and as certainly as any of those that fall under our immediate observation.

But I think the foundation is sure; there can be no elementary idea except by actual cognition, and there can be no cognition without an object cognized. Imagination without cognition there may be, and imagination, too, with no object really before the mind, and under its inspection at the time; but no cognition without the object. And in this element there is certainty. There may be false perception in individual cases, but it is from its very nature limited to individuals and to individual cases. The danger of error comes only when we begin to compound these elements into complex ideas. I have the idea of whiteness, and can imagine a white lion, though I never saw one, and there may never have been any. I have an idea of reason and of voluntary action, as well as of instinct, and I may err in ascribing reason and voluntary action to animals below man in the scale of being. But reason and volition do exist in the conscience of man.

Now here comes insight. I doubt if it ever gives any one simple element of our ideas, though I have formally so taught. But it does discriminate and enable us to see into the nature of things into the possible as well as some impossible combinations of these elements. As I have said I have never seen a white lion, but I know of no reason and can see no reason why there may not have been one. Carbon in a fluid form has never been seen by man, I believe; yet nobody knows that it may not exist in that state as a part of some other order of things. I have never seen a space inclosed by two straight lines, but I do know there never was one; the elementary ideas of such a thing are incompatible.

Error thus comes as Cousin maintains, not from or in actual observation, but from imagination and from reasoning, or only when we begin to imagine and reason, or both, in the process of forming complex ideas of things, idea-images and in reasoning from them.

And we depend upon insight into the necessary relations that exist between some of these properties for the axioms, self-evident truths or *a priori* principles of all the sciences. As, for example, between extension and divisibility, so that we say that whatever is

extended is divisible; between cause and effect, so that we say of whatever we know to be an effect that it is not eternal, that it is dependent and must have had a cause, and so on until we come to the First Cause of all things.

Few people seem to be aware how much of our knowledge depends upon the various processes of reasoning, from the few facts — few comparatively — and by means of the self-evident axioms of logic and mathematics. And when there has been no error, no fallacy in the process, the certainty is as great as if the fact were one of immediate observation; the truths that have been developed by mathematics are as certain as those that we see or have seen.

In thus denying the divine origin of any of the elements of our ideas I am by no means denying divine influence and guidance on our minds. On the contrary, no man believes in such a guidance and influence more fully than I do, but it is a guidance and influence in the formation of our ideas of things and our judgments and opinions about them, rather than in furnishing any of the primary or simple elements of those ideas or opinions, "He helpeth our infirmities." It is through this influence that we come to understand the things that are given to us by the Spirit of God and to have "a right judgment in all things."

This influence we are taught — and all experience confirms the teaching — depends upon our seeking and using it in the spirit of faith and reverent submission. Prayer is answered, as all who have ever sincerely and earnestly prayed believe; and God's Holy Spirit guides and will guide us when, rejecting our own wills, we seek to do his will.

Our subject is instructive and suggestive in many ways. It suggests a limit to knowledge. We can understand the instincts of animals because we belong to that order, but when we get below them, to the insects, such as the ants and bees, we see acts that we cannot understand. Those acts seem to imply intelligence, reason and will, but the animals have not the organs by which we exercise these functions and we cannot, therefore, understand *how* these insects do such things.

We need not stop here. In the inorganic world there are illustrations of our subject. I touch my finger to the key of an instrument and a click is heard on the other side of the continent. Nobody knows how this is accomplished, what the key does, *how* the wire performs its function. We talk about a fluid, electricity, and its passing over the wires, but then how does the key start it? How does it start the register that makes the sound? Here is wanting an element of an idea that we have never acquired.

Again, we all talk of gravity and the attraction one thing has for another. We can understand repulsion — we effect it with our hands — but the drawing of what is distant, as the earth draws the moon and the sun draws the earth, is something of which we have had no experience, no sense-perception of the elementary

ideas, no consciousness of what is done or how it is done. We are, in regard to such phenomena, like a deaf man who stands and sees people moving around him in obedience to voices and sounds which he cannot hear. He lacks an element of knowledge that is necessary to understand what he sees.

But if we look above us to God, the Creator, we find many examples. We have never *created* anything out of nothing. We cannot understand how it has been done. And there are those who, presumptuously, as I think, say that it cannot be done — it is impossible. But the only difficulty lies in our inexperience. We have done no such thing and we can no more understand how it was done than the blind can understand how we, that can see, move about avoiding collisions with all objects; or than the dumb can understand how we can be guided by sounds that they cannot hear. We have never foreseen clearly, definitely and with absolute certainty, any act which depends upon the free choice of another person, and, therefore, we cannot understand how foreknowledge is consistent with free agency, and we speculate about such things but come short of understanding them. The elementary ideas of a conception of them have never been given us in our experience, and God has not seen fit to give them to us as an *a priori* element of knowledge.

And it is so, too, in human life. We understand others only by our own experience. The fond caresses of a mother for her children, the patient enduring perseverance of a father with his wayward son, the groans and tears of the newly awakened penitent in view of his sins, the calm self possession and resolution of the martyr, are all unintelligible to one who has never experienced them, and knows nothing but the mere conventionalities and prudential expedients of life; they are but foolishness to him.

And this is not all. With the acceptance of this view of the origin of the elements of *all* our ideas and the construction of our complex or general ideas, we have the means of as great clearness and precision in treating metaphysical subjects or we have in the natural sciences. And metaphysics — what there is of it — may be stated in common language, becomes as intelligible in itself, and as certain in its results as any of the sciences that relate to what we see and handle in the world around us, and perhaps even more so — since it must relate to facts that occur within the experience and possible observation of all men.

I even fancy to myself that Hegel, paradoxical and obscure as he is, and utterly unintelligible as he appears to most persons, can by this means be made intelligible. What he means to teach us can, if I am not mistaken, be put into quite common place and intelligible language, though, of course, we cannot always agree with him. His great doctrine of co-ordination is simply that being without attributes, that is, as he calls it, absolute being, is the same as non-being; and we can say nothing of it. But any

particular thing, every something, must have its other; that is, there must be some other thing, and the two must have something in common while they are individually distinct and coördinate. Now merely as "the other," it has no properties that we know of or can affirm of it. Hence, *in this respect*, something is the same as nothing; that is, we can say nothing of it. But we could not even know of it. This Kant had taught. But it could not even exist except as something with properties of it. If this paper exists as paper, there must be its other or some other thing which is nothing, "its nothing" in the sense that we can say nothing about it, *so far* as this principle is concerned. But it is a something which we must have seen, or we could have no thought even of the paper, just as the blind, with no ideas of light and of color have, and can have no idea of darkness. The law thus announced by Hegel is, I think, in all respects, the peer of Aristotles' famous dictum *de omni et nullo*.

There is indeed one difficulty, however, that we cannot overcome. The facts we have to deal with are in the mind, and are matters of consciousness alone, and consciousness is purely a personal affair. No man has or can have access to any but his own. And, moreover, the facts are not like the truths of mathematics, which we can illustrate by diagrams on the blackboard, nor like the objects in the natural sciences, which we can exhibit in prepared specimens, or by experiments that are visible to the eyes of the pupils; they are all spiritual in their nature, and to be seen only by reflection and introspection.

Let the agnostics recognize the second class of elementary ideas, and they will see that, in the words of Huxley, "we do know more of mind than we know of body; the immaterial world is a firmer reality than the material." They will see, too, that the mind is not a mere abstraction, but a real cause — a veritable agent in the production of thought, and that, in fact, we know matter only through and by the mind. A sensation, without consciousness of it, is no means or source of knowledge. We can know nothing of an object by perceiving it, unless we know that we perceive it. Hence of the two, the mind is the firmer and best known reality, as Huxley has said, though, I fear, he meant it in something of scorn and derision.

Do you ask how I know that it is mind and not mere matter? I answer that I know in this case as in all others. Here are two pieces of metal before me. I call one of them tin and the other platinum. Why? Because they have properties, mechanical properties and chemical affinities and laws of combination, essentially different from each other. I call this paper matter, as I do everything else that is hard, externally visible by its color and inert in its law and condition of acting. I call that within me that thinks, mind, because it thinks and perceives, remembers and reasons, and is not inert but spontaneous in its acting. In volition and effort it

acts as a first cause, not merely as a secondary cause, acting only as it is acted upon and in response to forces acting upon it.

To deny, therefore, that mind is something essentially and substantially distinct from body is but to dispute about words, or to insist upon and persist in calling two different things by the same name, or something worse and more absurd than that.

But these philosophers do consciously and intentionally reject this class of elementary ideas. Comte says of Mental Philosophy: "It pretends to accomplish the discovery of the laws of the human mind by contemplating it in itself, such an attempt cannot succeed at this time of day." He speaks, also, of "the absurdity of a man's seeing himself think," and adds — or is it as a motive for the position he takes (?) — "This takes away the last phase (or ground) of theology."

Herbert Spencer is also very emphatic. "A cognition of self, properly so-called," he says, "is absolutely negatived" — rendered impossible, I suppose he means — "by the laws of thought." "Knowledge of it (the mind or self) is forbidden by the very nature of thought." And so we have agnosticism.

But somehow or other we do cognize self and think of self. There is nothing that a man is or can be more sure of than that he thinks and feels, remembers and wills.

Let us recognize these facts and give them their due consideration and we may have a mental science that is as clear, systematic and well founded as any of the natural sciences.

And it will be knowledge, too, in the strictest and most appropriate sense of the word; knowledge based on observed facts and built up by the most rigid rules of the inductive philosophy.

Let the idealists recognize the other great fact, that all our elements of knowledge, all elementary ideas, are gained by actual observation and cognition of objects themselves as substantial realities around us or within us — these ideas representing only the properties, modes and acts of such realities — and they will see that there can be no thought, no ideas, whether *innate*, *a priori* or *intuitive*, absolutely none, without a thinking mind, a mind that thinks, and some objects that are cognized and thought of, and we shall have an acknowledgment of the existence of God and the reality of the mind, with a clearness and common sense in our metaphysics such as we now have in our natural sciences. Had the Germans accepted this doctrine, we should not have had the hesitation and uncertainty of Kant, the impenetrable obscurity of Hegel, to say nothing of the nonsense of Hartman, or the pessimism of Schopenhauer. And the impression would not have prevailed, as now it does very extensively, that the doctrines of metaphysics are uncertain and useless, and profound about in proportion as they are unintelligible.

And finally this method and the acceptation and application of these facts will give to the doctrines of Reid and the Scotch school

a basis and a demonstration of their fundamental principles, such as they have never been considered as having.

All persons who are of a thoughtful or philosophic turn of mind feel and acknowledge that it is not enough to tell us what men do naturally believe or what we *ought* to believe and accept as first principles, in order that we may be led to such conclusions as we ought to hold or think we ought, in regard to religion and duty. The method is fallacious, and too superficial. To adopt *principles* with a view to the conclusions we want to draw and hold, is an inversion of the true order, and the only order and method that can give us an abiding system, or enduring results. We must begin by building on the rock, the solid foundation of indisputable and abiding facts, and build up with a logic that is faultless. And this is what our method will enable us to do for the principles that are generally held and advocated by the disciples of this school.

With the view I have been presenting, we have a metaphysics that is knowledge in the strictest sense and the only proper sense of the word. We shall see, realize and confess that we know as much of mind, what it is and how it acts and stands related to other things, as we do of any of the pieces of matter around us; what it is, how it acts and stands related to other objects.

We sometimes hear it said that we do not know what the mind *is in itself*, or, for that matter, what matter is *in itself*. But what does "in itself" mean in this connection? It is not one thing in appearance and another in fact or in itself. It is only as it is in appearance. Or do we mean to say that we do not know what it would be if it were not in relation to other things? Well, perhaps we do not. No one of these objects, not the mind of man nor any material object in existence ever existed except in relations to other things, and never can so exist. If there are but two things in existence, they must be, as Hegel has abundantly shown, *in relations* to each other, and if the time ever comes when there is but one thing in existence, there will be either nothing to be seen or nobody to see it.

Doubtless these relations may yet be changed, and will be certainly different in our next state of existence. But the present is enough for the present, and we may be sure that we shall be so changed as to be adapted to our next state of existence, whenever it shall please the Author of our being to call us into it.

We have, then, a universe of two co-ordinate parts, mind and matter, the one as substantial and as real as the other, and over and above them all a One, Whose nature, so far as we can comprehend it, or form any idea of it, in our present state of existence, is in no respect that of the material objects around us, but it is rather so much like the mind within us that we may truly say that we are "made in His image" and hope to know more of Him, understand His thoughts and ways better in another world.

If the doctrine of this paper be true, it will give a new force and significance to the oft-repeated doctrine that words can be explained only by reference to things. And this we always do in the natural sciences. Things are the same for all. God creates them, but man creates his own thoughts, and many of them are purely fictions representing no existing reality anywhere. Hence the obscurity of the German metaphysicians, they do not believe in things, but only in thoughts, and use words accordingly, and often with no reference to the things that exist, and with no regard to the relations they do or possibly can sustain to each other. It is, therefore, not only that we meet with new words and technical phrases in reading their works, but also that, in attempting to find a meaning for them, by reference to the things that actually exist and make up the universe, we find ourselves utterly at fault.

The following has been given as a specimen: "In the fifteenth century of Thursday afternoon occurred one of the most stupendous circumstances of the everglade perpetuity." It is grammatical, smooth, rather grandiloquent, but it is — very metaphysical.

In this discussion I have used the word idea in its common acceptation as implying that it is a reality in the mind representing objects or the properties of objects. But I have been very careful not to advance any doctrine or make any statement that really implies that it is anything more than a mere convenient fiction. The acquisition of knowledge is *as if* there were imperceptible elements that pass into our minds in the very act of cognition, and the subsequent processes of imagination, memory and reasoning are most easily explained on this hypothesis, and by this use of terms, just as in geography, we best indicate the location and extent of places, mountains and rivers, oceans and continents, by referring to and speaking of the equator, the parallels of latitude and the meridians of longitude *as if* they were realities. If, therefore, ideas are to be regarded as convenient fictions, no statement that I have made will need anything more than a mere change in its form; the truth I intended to assert will remain the same.

This, however, is more than can be said of any form or statement of the doctrines which assert any form of *innate* or *a priori* ideas. We classify the facts of nature, given by sensation, and call them heat, light, electricity, gravity, etc. We even make fictions of these so called "forces of nature" and speak of them as real causes. What we really mean is that the material objects of nature *when they are hot* act so and so, the same objects *when* luminous act so and so, the same objects *when* electrically excited act in accordance with what we call the laws of electricity. But it is the material objects of nature always and in all these cases and classes of phenomena that act and are the real agents and causes.

So in mental philosophy, the Scotch Reid and his followers began to use this form of classification. One class constituted perception; another imagination; and another reason; another will,

and so on. Locke speaks of these classes as mental faculties, and warned men against regarding them as parts and organs of the mind. Reid called them "powers," and since his time both words are in use; and we have come to regard them as Locke foresaw and warned us against doing, as realities in mind, and not mere words and fictions of the mind's creating. But, as in motion, it is only the material objects that act, so in consciences. It is the mind that perceives; the mind that imagines; the mind that remembers; the mind that wills; and when we speak of "*the* reason," "*the* memory," "*the* will," etc., we can mean, if we really know what we mean, and are not repeating parrot-like words that we have learned by heart and to repeat in *verbis magestri*, the mind perceiving or acting in the way of perception, imagination, will, etc.; they are not parts of the mind, but only modes of its acting.

It is generally conceded that "*Locke's System*" as it is called, that is, the theory that all one's ideas come from sense-perception was, to a large extent, the parent of Paley's System of Moral Philosophy, a system now repudiated, I believe, by all professed teachers of moral philosophy, and has also given sanction to those views of political economy and social relations which have led to the application to it of the epithet of the "dismal science." Had the other part of Locke's theory been recognized and received as much attention and as full an application as the sensational part, it would have given us a spiritual philosophy which, doubtless, would have changed, to a large extent, the current of thoughts and speculation among the English speaking people. It would have started out with the fact as its leading doctrine that we know mind or self better than anything else; know it first and last, and know it, moreover, as that which is best worth living for and providing for in this world as well as the next. We should have seen, by a careful study in that direction, that loyalty and devotion to some superior being is essential to its welfare and healthy acting, and that, so far as our own souls are concerned, as well as in regard to our fellowmen, it is better to err, if err we must, in the direction of self denial rather than self indulgence, and on the side of generosity, and of suffering wrong, rather than in a direction of meanness and wrong-doing.

I have not time or space to follow out all of the results of this view of the elements of knowledge — their origin, their nature and their limits. But I think that when it is fully carried out, as I have no doubt it will be, it will be found to throw a stream of light along the whole line of metaphysical discussions, and to afford a new and more satisfactory solution of some of what have been regarded hitherto as their most important as well as most difficult problems. It will draw a new line between what may be regarded as the domain of knowledge and of certainty on the one hand, and what is mere speculation and conjecture on the other. And it opens up a way to a region of faith and a realm of objects

which are, and ever must be, while we live here, objects of faith, and of faith only. It is by laying hold of them that we gain our purest impulses, our most unfailing courage, our strength in weakness, our most enduring hopes and our unceasing aspirations after something higher, holier and more satisfying, as well as more enduring, than anything this world and the objects of sense can afford. Faith looks through and beyond all the objects of mere knowledge, and lays hold of what is now beyond immediate cognition. Faith is the most uplifting of all the influences that can act upon us or within us here. It is the tie that binds us to God and to eternity. But then, faith must rest upon knowledge. Even while our church spires point to heaven they must stand on the firm foundation of the solid earth beneath. If faith without works is dead, so assuredly faith that is not based on knowledge is most sure to be mere caprice or senseless superstition.

Our senses are adapted to the world around us, or at least we know of the world around us only what we have the organs of sense to perceive; and it is conceivable, or at least supposable, that we may have other senses and come to take cognizance of facts and relations of things of which we have no conception at present. But this thought is especially suggestive in regard to the future world and a spiritual state. The senses we have here might be and probably would be of no use there, and facts and objects that we now see not, "that the eye hath not seen nor ear heard, nor the heart of man conceived" as yet, may come to be the most obvious facts and the best known of realities when we enter that world where our corruption shall put on incorruption, and our mortality be clothed with immortality, and we shall both see as we are seen and know as we are known.

VII.

THE RELATION OF HIGHER EDUCATION TO RELIGION.

By President William De W. Hyde, Bowdoin College.

The higher education can only indicate its lofty claims by showing its vital connection with the every day concerns of average men and women. Let it be suspected of exclusiveness, and it will be distrusted. Let it be judged impractical, unrelated to the real interests of the people, and popular support, both of money and of men will be withheld.

Last year, in a most thorough and conclusive manner, the material and social benefits which higher education brings to the community were here set forth. To-night I shall endeavor to indicate the points of contact between the higher education and those spiritual aspirations which it is the function of religion to satisfy.

This is a subject on which two diametrically opposite views have been held. In a general way, allowing for individual exceptions on either side, it may be said that the Latin church has regarded the relation as external and arbitrary; a matter of judicious expediency if not a tolerated evil. Tertullian, the father who contended for the materiality of both the soul itself, and its future environment, refused to allow a Christian to be a teacher in secular schools where Greek and Latin mythology were taught; and only on the plea of necessity did he permit the children of Christians to acquire "*sæcularia studia, sine quibus divina esse non possunt;*" Cyprian, the father whose political philosophy is indicated in his remark that "Kingdoms do not rise to supremacy through merit, but *are varied by chance*," likewise in the references he deigns to make to "Pagan philosophy" is strenuous to separate it as far as possible from Christian faith. Jerome, trained himself at Rome in classic literature, conceded the reading of authors like Terence and Virgil to the young as a necessity, but regarded a love for them cherished and indulged in later life as criminal.

Augustine also laments the delight he found in youthful study of the Latin poets, and though he, like Jerome, defends the employment of such learning as an efficient aid in the defense and exposition of Christian truth, yet he defends it by the analogy of the Israelites who took the gold and raiment of the Egyptians, leaving behind the idols and superstitions; and at length falls back on the practical utility of such studies as helps in the technical work of the preacher.

Gregory the Great threw the weight of his powerful influence against secular studies, forbidding the study of classic literature to his bishops, and declaring instruction in such studies to be unworthy of even a pious layman.

In the eighth century Charles the Great undertook, with the aid of Alcuin, the restoration of learning. Here, however, the motive put forth for such study is still external, appealing to the better understanding of Scripture which general culture would bring about. "For," says the capitulary, "since the Scriptures contain images, tropes, and similar figures, it is impossible to doubt that the reader will arrive far more readily at the spiritual sense, according as he is the better instructed in learning."

It is needless that I here recount the long and familiar story of the later antagonism of the Latin church to secular learning, and the jealousy of all philosophy and all science which could not be subjected to a servile conformity to her own preconceptions. From first to last, wherever Latin Christianity, with its notion of a remote, external, purely transcendent Deity has prevailed, there the relation between higher education and religion has been either admitted as a necessity, to be jealously watched, and guarded, and held in check; or else it has been openly opposed and rejected.

To be sure, throughout all this time there have been individual minds rising above this external conception of God, and this arbitrary connection between education and religion. Indeed, nearly all our endowments for higher education have been the gifts of such broad-minded, far-sighted, deep-souled religious men. Religious men from first to last, even within the Latin church, and often under the influence of the Latin conception of a purely transcendent Deity, have done the most and the best work in both classic and scientific studies. For science after all, as Dr. Hedge has well said, is the offspring of the church. Born in monkish cells, the foundling of religious houses, vowed to Christ and the saints, nursed by cowled friars, cradled among crucifixes and breviaries, with men like Raymond Lully, Roger Bacon and Albert the Great for its sponsors, the child was baptized with the Holy Ghost. And yet, while this is true; while as I hope we shall see science could not have had other than a religious birth and baptism, it is equally true that there has been throughout the entire history of Latin Christianity, and the reign of the Latin conception of a purely transcendent God, an antagonism, latent or expressed, between learning and religion. They have been suffered to associate as co-laborers. Religion has deigned to acknowledge learning as her handmaid. She has not, she could not, consistently with the conceptions dominating the Latin church, own her as a sister

Fortunately, however, the Latin, with its deistic conception of a transcendent God, remote in time, distant in space, aloof from nature and alienated from humanity, is not the only type of Christian faith.

From the first centuries there has been, shining with a pure and steady light, a warmer, brighter, more natural, more human type of faith. And, like the rays of some far off star which has been shining for uncounted ages, yet through the immensity of heaven's impenetrable deeps, has but just succeeded in reaching us with its bright welcome, so through the long centuries the Greek doctrine of the immanence of God has been serenely sending forth its healing beams, until at length they seem to be winning a response from the receptive hearts of the present generation.

According to this view, God is not merely a vague, spatial, semi-material omnipresence, as many are tempted to regard Him when first they seek deliverance from the notion of far-off anthropomorphic architect. His ommipresence is rational, spiritual, wherever there is being there is thought, and that thought is manifested God. Without such thought or idea, or law or reason, or word or wisdom, no clod of earth maintains its form; no wave of ocean lifts its crest; no moving air sweeps through the forest, no brook winds its way from the mountain to the sea. Without this indwelling reason no germ bursts its integuments; no branch puts forth its bud, no flower unfolds its petals; no pollen begets in the ovule the offspring which another spring shall summon forth to life and beauty. Especially within the mind of man no true thought rises to consciousness, no right desire is cherished, no pure affection is entertained, save in so far as the finite mind and will and heart thereby participate in the absolute thought and will and love of God. Without denying the reality of the finite, or the freedom of the individual will, and thus falling into pantheism, this view still maintains that the reality of the finite is not in separation but rather in union with the infinite; and that the human will attains its true freedom only in perfect conformity to the perfect, all embracing will of God.

One would say at first sight that such a view of God must naturally lead to a view of the relation of education and religion altogether more sympathetic and vital than that which has been handed down to us through the traditions of the Latin church. And such we find to be the case.

Clement, of Alexandria, the great representative of the Greek faith in an indwelling God, insists at every point upon the vital and essential unity of religion and learning. Says Professor Allen: "Because deity indwelt in humanity and the human reason partook by its very nature of that which was divine, Clement was forced to see in the highest products of the reason the fruits of a divine revelation. He makes no distinction between natural and revealed religion, between what man discovers and what God reveals. The higher activities of human thought and reflection are only the process by which the revelation of truth is conveyed to man." Clement admits, as we all must, that a man can be a believer without learning," but he also asserts that "it is impossible

for a man without learning to comprehend the things that are declared in the faith." He contends vigorously against "those who object, what use is there in knowing the cause of the manner of the sun's motion, for example, and the rest of the heavenly bodies, or in having studied the theorems of geometry or logic and each of the other branches of study on the ground that these are of no service in the discharge of duties, and the Hellenic philosophy in human wisdom." He tells them that "they stumble with reference to the highest things," and exclaims, "How irrational to regard philosophy as inferior to architecture and shipbuilding!" The intelligent believer he urges "to take from each branch of study its contribution to the truth." Prosecuting then the proportions of harmony in music and in arithmetic, noticing the increasing and the decreasing of numbers and their relations to one another, and how the most of things fall under some proportion of numbers; studying geometry, which is abstract essence, he perceives a continuous distance, and an immutable essence which is different from these bodies, and by astronomy again raised from the earth, in his mind he is elevated along with heaven and will revolve with its revolution, studying ever divine things and their harmony with each other from which Abraham starting, ascended to the knowledge of him who created them. Again, he says, "Let us then receive knowledge not desiring its results, but embracing itself for the sake of knowing."

Such is the intimate relation between religion and higher education as it lay in the mind of the Greek father. Every indication points to a revival in our day of the Greek type of Christian faith. The immanence of God, the incarnation, the sonship of man to God, the indwelling spirit, these are the central doctrines of the faith of intelligent believers in our day as among the Greek fathers in the first centuries. As the confluence of all systems then at Alexandria, so the growth of criticism and science is presenting to the choice of men to-day as the only alternative, either a faith at once profoundly spiritual and broadly rational, or else no faith at all. Without faith men never have lived and never will. It needs no prophet's vision to foretell in the near future a mighty reawakening of that type of religious faith which views God through his word as everywhere revealed, and man by virtue of his rational nature a partaker in the Divine reason. In every great movement it behooves the leaders of education to be awake. Especially does it devolve upon us to be alive to this religious movement, since with the restoration of this type of faith there comes a nobler and higher conception of what the mission of education is.

By this historical discussion having shown that if what I am about to say seems in conflict with one conception of religion, there yet is another with which it is fully in accord, I may now venture to announce my thesis, which is this: The relation of higher education to religion is that of contents to form. Uneducated religion is

empty and unsubstantial. Irreligious education is chaotic and inconsistent.

Education and religion are by no means identical. It is not true that, as Goethe said, "He that has art and science has also religion." Yet though not identical they are practically inseparable. Though in thought they are distinguishable, they are in fact indivisible.

The claim of such indissoluble unity of interests often supposed to be divided must of necessity meet antagonism from both extremes. The self sufficient savant will scorn the insinuation that his vast mass of accumulated information is, taken by itself, only a "*monstrum horrendum informe ingens cui lumen ademptum.*"

The narrow religionist will haughtily repudiate the idea that when divorced from knowledge, his rites, his ceremonies, his ecclesiasticisms "are shadows, not substantial things." Each will feel that the indispensableness of the other is a detraction from its own importance. Yet, in truth, it is only in and through the other that each gains its proper dignity and grandeur. If I have occasion to show that divided they fall, it is only that I may make more manifest the (complementary) truth that united they stand.

Religion without education is empty. It is a form devoid of contents. This statement is not intended to deny the fact that an uneducated man may be as devout a worshipper and servant of God as the most learned. The individual man, though himself untrained in the learned culture of his day, yet unconsciously shares in the universal enlightenment of the community in which he moves. From the general conceptions of astronomy, natural history, ethics and economics, it is impossible to exclude even the uncultivated member of a civilized community and a Christian church. Accordingly the exception of individual men who are Christians, and at the same time uncultured, is an exception more apparent than real. For throughout every civilized Protestant, Christian community, except such abnormal conditions as slavery or misrule, or industrial oppression carry in their wake — in every normal Protestant Christian community, where papers are read and preaching is heard, there is shed abroad a general enlightenment in which even the humblest individual of necessity partakes.

Granting, then, this apparent exception in the case of individuals, we may, without fear of misconception, affirm that in the community at large religion without education is a formal, empty, unreal affair, and that the real religion of a nation is bound up with its higher education.

In order to recognize this truth we must have in mind very clear and definite conceptions of what religion is. If religion is vague awe in view of the unknowable, as the agnostic declares, obviously higher education has nothing to do with it. Between such a conception of religion and higher education the only relation possible is that between the fabled pot of gold at the end of the rainbow, and the credulous child who pursues it. The farther we extend

our knowledge the farther off do we thereby push the limits of the unknowable. On such a theory the only difference between learning and ignorance in its relation to religion is that learning stares at vacancy from a higher eminence and looks at nothing through a bigger telescope. Truth and God are related only as antitheses.

Pietism, or the religion of mere feeling, likewise has no relation to education. If feeling is everything, then, no doubt, the less nervous energy one is called upon to bestow in intellectual lines the more he will have to give out in response to emotional appeals; and the more he can contribute to the edification of a company who measure the intensity of their devotion by loudness of exhortation, depth of groans, frequency of ejaculation and abundance of sensuous excitation.

Passing by agnosticism on the one side and pietism on the other as equally irrational, and consequently altogether out of relation to knowledge and education, we may resolve all genuine religion into two elements, worship and service.

The problem of the relation of religion to higher education resolves itself into these two inquiries: What does higher education contribute to the worship of God? What does higher education contribute to the service of God?

Let us consider, first, the dependence of worship on higher education. Worship must have something definite to lay hold on. "No man hath seen God at any time." No thought of man can represent him in the depth and fullness of his Infinite Being. Yet, on the other hand, worship cannot go out into empty space. You cannot direct it toward blank vacuity. Worship must have a medium. Praise and thanksgiving, adoration and homage must have something present to the mind. What shall that something be? This is the problem of problems in religion. To it there are two, and only two, answers. Either worship may seize on some external object, some arbitrary rite, some artificial ceremony, and make that the contents with which to fill out the form of worship. This is idolatry; the substitution of some creation of God, or some fiction of man, for the uncreated spirit and truth of God. Or else, worship must lay hold on the creative thought, and reason and wisdom and word of God, as He has revealed himself in nature, in history, in literature and in the mind of man. This is true worship, and obviously it is higher education in its various departments of science, history, literature and metaphysics, which alone can furnish to the common consciousness the true conceptions of the expression God has made of himself in creation and providence. Truth forms the contents of which worship is the religious form. The Hebrew religion demonstrates its divine character and is assured of a lasting place in the world's devotion by the fact that her prophets and psalmists did thus identify their religion with the learned culture of their day, and worship God through the medium of His historic acts and His creative will, as revealed in the history and science of their day.

It was the works of God that they seized on as the medium of communion and praise. "One generation shall laud *Thy works* to another, and shall declare thy mighty acts." "Wonderful are Thy works and that my soul knoweth right well."

In the one hundred and thirty-sixth psalm, that grand pæan of Hebrew praise, the motive is found throughout in those expressions of God which it is the province of history and science to trace. Thanks is to be rendered "To Him that by understanding made the heavens." "To Him that spread forth the earth above the waters. To Him that made great lights. To Him that smote Egypt in their first born and brought out Israel from among them, with a strong hand and a stretched out arm."

In the one hundred and forty-eighth psalm likewise, sun and moon, and stars of light, dragons and all deeps, fire and hail, snow and vapor, stormy wind, fulfilling his word, mountains and all hills, fruitful trees and all cedars, beasts and all cattle, creeping things and flying fowl, kings of the earth and all peoples, princes and all judges of the earth, old men and children, both young men and maidens, are recognized as the medium through which the worship of the creature ascends to the Creator. The very objects with which the higher education deals were the means by which the devout Israelites, in the days of Israel's religious vigor, expressed their worship. Is the natural world or the providence of God less sacred to-day than then? If they praised God, as manifested in the history of their nation, and the birds and beasts, the rocks and mountains, the trees and flowers of Palestine, shall not we to whom the history and science of the whole world is open, recognize in the wider knowledge and science of our day the means of a fuller, grander worship and communion than was possible to them? Not by servile repetition merely of what was the highest attainable by them; but by doing with reverence and fidelity in our day what they did so grandly in theirs; by seeing and adoring God in every truth and beauty that nature discloses to the science of our day; by recognizing and revering Him in every upward and onward movement of the moral order of States and nations shall we be as devout in our Christianity as they were in their Judaism. The idea of a distinction between sacred and secular science, after countless defeats and overthrows, is pretty well exploded. We may reasonably hope that with the futile onslaught that has been made on Darwin and the doctrine of evolution this disgraceful chapter of human misconception may be closed; and that hereafter, while differences of opinion will continue to prevail, and controversies will continue to wax fierce, yet the banners of secular and sacred science will cease to wave over the contending hosts. May we not anticipate, too, as not far distant the day when the barriers between secular and sacred history shall be swept away by the rising tide of a profounder religious spirit which sees that all the life of men and nations is sacred; and even special intervention in the history of our people

marks their sanctity as different in degree but not in kind from that of every just and God-fearing nation that has been or yet shall be? Then when science shall unfold the principles which underlie the beauties and utilities of nature; when history shall spread out before us the laws by which societies and States attain greatness and well-being; when humanity shall praise the living author of these principles and laws, then, and not till then, shall we take up the torch of true spiritual worship where the great souls of Israel and early Christianity left it, and bear it forward for the guidance and illumination of the ages yet to come.

Only by the union of higher education with religion; furnishing from their respective spheres contents and form, can the worship of our day have that prophetic originality, which is ever the stamp of vital union of the living God with living men.

The second essential element in religion is service. How shall we serve God? Here, again, two courses are presented to our choice. Either we may rest back upon some outward ceremony or elaborate ritual and call that in itself "Divine Service," in which case again we are practicing a more or less refined idolatry; or else we must serve God by practical endeavors to make the world in which we live more beautiful and bright, its vegetable life more perfect and useful, its animal inhabitants more docile and gladsome, and above all man himself more happy, more generous, more pure, more wise, more Godlike.

Such and so practical was the service required by the law of ancient Israel. "Thou shalt not seethe a kid in its mother's milk." "Thou shalt not muzzle the ox when he treadeth out the corn." "Cursed be he that removeth his neighbor's landmark." "Cursed be he that wresteth the judgment of the stranger, fatherless and widow." "The wages of a hired servant shall not abide with thee all night until morning." "And when ye reap the harvest of your land, thou shalt not wholly reap the corners of thy field." Scarcely less explicit are the prophets in their denunciation of those that "oppress the hireling in his wages, the widow and the fatherless, and that turn aside the stranger from his right, and that fear not the Lord." The service of God, according to the Jewish faith, involved precise and definite conceptions as to husbandry, agriculture, domestic and public economy, civil rights, judicial procedure, the relation of land, capital and labor, and the foreign policy of the nation. Now it is needless to say that the only way in which the true and the right in these relations at the present time can be determined is by the prosecution of such studies as physiology, botany, chemistry, ethics, political economy, sociology and constitutional history — the very studies with which higher education deals. Neither the Old nor the New Testament defines the line between legitimate speculation in which a real future need is anticipated and provided for; and illegitimate speculation in which an artificial need is created, in order that one man may

profit by what he causes another to lose. But a thorough study of economic conditions will show a man where the truth and righteousness, that is where the will of God, about that matter lies. The Hebrew law will not point out in explicit terms the way in which the Godly man should vote on the tariff in 1886. But political economy will. No passage in either testament will tell you what to say to the beggar at your door. But the study of social conditions will. No man will venture to assert that Christianity is intended to include less than Judaism. On the contrary, the distinctive glory of Christianity lies in this, that it is the form of an infinite content. It is adapted to include every phase of individual, family, social, industrial, commercial and political life. Yet it gives few precise rules. It gives the form in its own comprehensive law of love to God and man. It gives the pattern in the life of Jesus Christ. It gives the motive in his sacrifice. It gives the flowing outline in its delineation of the Christian graces, faith, meekness, compassion, hope, love. But the work of filling in these outlines and reproducing in individual lives the grand pattern is left to human intelligence. And higher education on its practical side, as it deals with ethics, economics, sociology, political history and constitutional law, sets forth the contents of which Christianity is the form. Unless I know something of the laws of physiology and hygiene I cannot in the highest, fullest sense present my body a living sacrifice, acceptable to God. How many men and women there are to-day of intensest devotion to God, so far as the formal act of consecration goes, who yet from ignorance or neglect of hygienic laws, are offering him the service of bodies which in their actual concrete material condition are anything but acceptable either to God or men. Their service is complete in form, but the contents are inadequate. How many a worthy layman is sincerely offering the undivided service of his soul to God; and yet the outcome of whose business, highly profitable to himself, is dooming some fellow creatures, brothers and sisters of his, to hardship and privation and want. The general diffusion of sound teaching on ethics and economics would help him to save himself from this shameful contradiction. Here again the influences of higher education are needed to furnish adequate contents to the already perfect form of religious service. It is not just to assume that every man who taxes the consumers, rich and poor, throughout the country an extra penny for their kitchen fire and evening lamp in order that he may pile up the dollars that monopoly and a limitation of the output pour into his treasury; it is not just to say that these men are all knaves; some of them doubtless are; but many more as they receive their profits and give away their tithes, verily think they are doing God's service. They are ignorant, and under the circumstances they are doubtless forgiven by God, and excusable in the sight of men. But it is the mission of higher education to

enlighten them and make them without excuse. And in a community where the sound teaching of ethics and political economy should be generally diffused, the man who should by any device, whether by corners in grain, or round-about devices in railroad construction, or artificial fluctuation in stocks, or adulteration of groceries, or selling of intoxicating drink, get gains dependent upon corresponding loss and injury to others, would have to take his proper place, his "ἴδιον τόπον" as was said of Judas, by the side of thieves and malefactors and public nuisances. Shed abroad from your colleges and universities the searching light of strict ethics and sound political economy, and your deacons who draw ten per cent. dividend from underpaid labor, your church members who are in anywise responsible for the evils of intemperance; your Sunday school superintendents who water their stock or adulterate their goods will be compelled to define themselves more precisely as to their relation to the rival masters God and Mammon. Let sanitary laws be diffused; let the responsibility of landlords be understood; let the right relation of the capitalist to the laborer be clearly defined; and the question about the prominent members of society will cease to be the superficial questions "How much is he worth? What is his income?" and in place of them will be put the infinitely more important questions "How did he get his money? How much was human misery or human welfare increased by his acquisition of it? How is he fulfilling the responsibilities which the administration of such wealth involves?" and the moment these latter questions are substituted for the former, aristocracy, you perceive, will begin to rest on a sounder basis; the man will be reckoned worth most who does the most good; and the popular estimate and the Christian standard of manhood will begin to coincide. In other words, Christian consecration will have contents adequate to its form. And without the diffusion of such higher education such contents cannot be furnished; and consequently such much to be desired coincidence and consistency cannot be attained.

Without further illustration, I trust it is evident that for service, as for worship, an intellectual content in the form of truth, principle and law is quite as essential as the emotional or volitional form of reverence and consecration. Without such contents, religion is empty and unreal; superstitious in its devotion and inconsistent in its practice. If this be true, then higher education stands to religion in the relation of inside to outside, of body to figure, of contents to form. The relation between them is that relation of organic unity of opposite elements which is the principle of life and being everywhere. Though distinguishable, yet the one cannot exist without the other. The cause of higher education is also the cause of true religion. The true professor is likewise a prophet of God, and they who give of their money and their service to the furtherance of sound learning are no less truly

the priests and prophets of God than those who directly support and administer the institutions of religion. We are told in the inspired Word of God that wisdom, the truth, the word, was with God from the beginning, and without the Word nothing was made that was made. So may religion, whereby man is related to God, and higher education, whereby man is related to the wisdom and rational expression of God in nature and history, be evermore united in holy bonds and bring forth their beautous offspring of peace and justice and love and blessedness.

Our oldest university started with the simple motto "*Veritas.*" It may have been bigotry that, some years later, sought to supplant the ancient motto by "*Christo et Ecclesiæ.*" It certainly was bigotry of the narrowest, shallowest type that, within the past few years, has been clamoring for the removal of that second motto. Let us rejoice that neither religious narrowness nor hollow intellectualism has triumphed. The old university enters on the second quarter of her first millenium next November with a new seal — *Veritas* upon the open books at the center, and *Christo et Ecclesiæ* around the circumference encircling all. May this new seal of our oldest university be the emblem of the true union of higher education and religion in every institution of every State throughout this land forevermore.

VIII.

[Professor Sauveur was not present to read his paper upon "The Natural Method of Teaching Languages." The following is the discussion upon the topics.]

REMARKS OF C. W. BARDEEN, EDITOR OF THE SCHOOL BULLETIN.

Mr. Chancellor and Members of the Convocation. — I think I can best justify the plea for sympathy in my behalf the Chancellor has just made by relating the substance of the conversation that brought me here. Principal Bradley, whom it is always difficult to refuse, came to me last night and said that as Professor Sauveur would not be here this morning he wanted me to stand up and say something in the time Professor Sauveur would have occupied.

"But I don't know anything about the natural method of teaching languages," I said.

"That is nothing" he replied; "the discussion is going to be on the other side. You will really be a sort of ninepin set up to be bowled down. It doesn't make much difference what wood the ninepin is made of; it is the bowling we are interested in. We want somebody who doesn't mind being knocked down, and we choose you because you are used to it."

With this introduction you will understand the circumstances under which I appear. It is not the old illustration of a little man rattling around in a big man's shoes, but a new one of a dummy set up, scare-crow like, to keep the field open till the real man comes in later.

Preliminary to a discussion of this subject, I suppose there must be some agreement as to what the purpose should be in teaching modern languages.

Shall the attempt be to enable the student to read the language with tolerable readiness, leaving the speaking of it to be attained at some future time if there is special occasion for it? This is, as I understand it, the claim of Professor Whitney, in the preface to his German Grammar. Or shall stress be put upon the conversational element, enabling the student to understand readily and to speak fluently the phrases of ordinary intercourse? This may be regarded as the immediate purpose of the "natural method." Or, again, shall the teacher hope to make accomplished linguists of his students, mastering the language in all its intricacies, and speaking it so that it shall seem his vernacular?

This last, so far as the possibilities of ordinary instruction extend, is the dream only of young teachers. In French, for instance, one's humiliation in his first attempts to speak as Parisians speak is measured only by the confidence with which he undertakes it. Take a single and simple illustration. The first day I was in Paris

I went up to one of the little newspaper stands and asked the old woman if she had a copy of *Figâro*.— "Of *Figaro? O oui monsieur*," she replied, cheerfully correcting my accent. Glad to be instructed, I was careful the next morning to inquire of the same old woman for a copy of *Figaro*. — "Of *Figâro? mais, oui monsieur*," and the correction was as cheerful and as positive as before. Determined at least to know how one French word was pronounced I went to the *Opera Comique* to hear the Barber of Seville. Before the first act had proceeded far the call came, "*Figâro! Figâro! Figâro!*" "It was unmistakable; the accent was upon the second syllable. Just as I was settling myself down to this one positive conviction, Figâro came upon the stage and began with volubility to complain of the frequent calls made upon "*Figaro! Figaro! Figaro!*" *Figaro!* The French do not accent their words at all, says one. The accent is not arbitrary, but is a sort of stress of emotion, says another. All I know is that whatever syllable I accent, or if I accent syllable at all, I am equally sure to be corrected in Paris.

There are many stock anecdotes that illustrate the same point. Take the well-known story, told by Dr. Sauveur himself, I believe, of two literary Englishmen in Paris. One went out earlier than the other, and said to the servant, "*Ne laissez pas sortir le feu*" (Don't let the fire "go out"). Unhappily he pronounced the last word more like *fou* (fool), and the servant interpreted it, "don't let that maniac get out of the room." Presently the maniac wanted to visit the Louvre, and was astonished to be met at the door with first advice, then entreaty, then expostulation, and finally command not to pass the threshold, and his friend returned to find him struggling with four men who were holding him down to the floor. It was like the pathetic ballad that used to be a favorite at school exhibitions when I was a boy,

Stay, jailer, stay and hear my woe,

etc., and ending

I am not mad, I am not mad,

only in this case the victim was mad,— mad as a hornet.

They tell of another Englishman who meant to say, as he sat down in a restaurant, "*J'ai faim*" (I am hungry). But he pronounced it so that the waiter undertood him, "*J'ai une femme*" (I have a wife). The Parisian waiter is never astonished, and he replied gravely, "*J'espère que madame se porte bien.*" Seeing that he was misunderstood the Englishman made another attempt. "*Je suis fameux*," he said undoubtedly meaning to assert that he was famishing, but really declaring himself famous.— "*Je suis bien aise de le savoir*," replied the waiter with deference. Then the Englishman girded up his loins and made a final effort, declaring, "*Je suis femme*" (I am a woman), to which the waiter could only reply "*Alors madame s'habille d'une façon tres étrange*" (Then madame attires herself after a queer fashion); and the Englishman fled.

I think we may set it aside as impracticable that the average

student shall master French or German so that it shall be to him as his own tongue; and the question before us becomes reduced to this: Shall we start with the grammar and give a scientific knowledge of the language, for reading; or shall we start with conversation and give a fluent knowledge of a few phrases of the language, for speaking.

In favor of the first it may be said that except to those who travel in Europe the occasions for spoken French are few, while almost every book one takes up has quotations or allusions that require one to be able to translate French readily. Moreover the traditional method of learning Latin and Greek, which are usually undertaken before the modern languages, has prepared the student for the application of the same method to French and German, his knowledge of all four languages being broadened by the sort of comparative grammar he thus insensibly acquires.

It will also be the verdict of most teachers that this grammatical knowledge is the only sound basis for conversational use of the language; and that while it is true that it is not the means through which the infant learns to speak his own language correctly, on the other hand there is no warrant for assuming that the disciplined mind of youth will work to most advantage by imitating the haphazard gropings of childhood. When one becomes a man he puts away childish methods, as well as childish things.

On the other hand, it is claimed by the advocates of the natural method that to begin with the grammar is a positive bar to fluency in speaking and especially to readiness in understanding a foreign language. Book-knowledge of a language is knowledge by the eye, not the ear. "*Est ce que vous pouvez m'entendre?*" As I spoke that sentence, I dare say every one of you consciously or unconsciously put those spoken words into printed form and *saw* them in your mind's eye before you recognized them. The spoken words did not convey the idea directly. You went through the intermediate processes of thinking how the sounds I uttered were spelled in French, of printing them out before the eye as thus spelled, and then and only then, of translating them as you would have translated them if printed in a book.

Now these intermediate processess, however unconscious they may be, are a bar to fluent conversation. If the "natural method" can ensure understanding by the ear without the intervention of the eye, it establishes a positive point in its favor. Again, it begets confidence. After a rebuff or two in conversation, book-French becomes untrustworthy. Practice in inquiry as to whether one has the silver pencil-case of the wife of your cousin's father-in-law, does not prepare one to order a successful dinner at a restaurant. For actual utility the few phrases in Bædeker's hand-book, half-pronounced, will sometimes procure a man what he wants in a foreign country, when a man who can read *Corinne* at sight is at a loss. You all remember the story of the man who happened to be at a

place in Germany where the special delicacy was its mushrooms. He wanted some, but he did not know the German word for mushroom; so after numerous failures to make the waiter comprehend he took out his pencil and sketched upon the bill of fare a picture of the vegetable. "*Ja! Ja!*" cried the waiter in delight, and rushed off to return in a moment with a raised umbrella.

As a matter of fact what might be called the official vocabulary of traveling is short. With a few score of phrases well in hand, a little ingenuity in variation of expression will enable one to make one's self understood in regard to almost anything outside the realm of abstract ideas. A Syracuse woman who had taken one of the five weeks' courses in German declared to me that she could express in that language every thought that came into her mind, and I rather think she could. It would not require a large vocabulary.

Of course to an intelligent person mastery of French or German is the study of a lifetime, as mastery of English is the study of a lifetime. What five-weeks' course would give Professor Root the command of English he showed in his final remarks yesterday afternoon, when every word, always the exact word, fell pat into its place without pause or effort? But there is much in getting a start, so that one may feel sure of comprehending and answering properly the first phrases of a foreign tongue that are likely to fall upon his ear. This readiness and confidence the "natural method" secures, and it is no small advantage.

There may be overconfidence. The principal opposition to this method comes from the extravagant claims of some of its followers. I am told that Professor Sauveur states that he can impart to an intelligent student a through knowledge of French if he can have him five hours a day for a year. This means eight hundred hours of solid work; and the claim is not unreasonable. It is probable that a competent teacher could attain this result in this time by any method.

In a conversation on this subject, the other day, Professor White, of Cornell University, asked what preparation in the time they could give there was of most service to students likely to become teachers. I replied that I thought they should certainly have along with their grammatical knowledge enough practice in conversation to make them confident in the simple phrases of ordinary intercourse. I think this confidence may probably be obtained most quickly through the Sauveur method, and I should deem it of great advantage to a student thoroughly grounded in grammar to take a supplementary course or two in one of these summer schools.

I have no doubt that for young children this is the proper method. The important consideration for them is the pronunciation, which they can secure under competent instruction while their vocal organs are flexible.

Beyond this I am unable to express opinion. I have spoken without special preparation, and without other than mere general

impressions upon the subject. None of you can have so much occasion as I have to regret that Dr. Sauveur is not present to speak for himself.

Remarks of Principal F. J. Cheney.

Mr. Chancellor, Ladies and Gentlemen of the Convocation. — My regret that Dr. Sauveur is not present to-day has been expressed by those who have preceded me. I wish to say, however, that in a brief correspondence with me, he said the subject assigned him upon the programme was not exactly the subject that he understood he was to speak upon. His idea was simply to discuss a method of teaching ancient languages. It was not his purpose to discuss the natural method of teaching modern languages. He also stated that he did not for a moment unndertake to apply to the teaching of the ancient langnages, the modern or the natural method, pure and simple, but that if anybody desired to know what his statements with regard to this matter would be, they would find them principally in a little pamphlet that he had issued entitled "An introduction to the te ching of ancient languages." I presume that nearly all if not all the persons present have read that pamphlet. The method of teaching Latin I believe is given in the pamphlet. It is briefly stated, something like this: He brings his pupils up before him, those who have not yet learned any Latin, and opens to them a book of Cæsar. The book that he himself holds contains not an interlinear but a literal translation of the text at the end of the volume. The book that the pupils hold before them contain neither an interlinear nor a literal translation; but in his "Talks with Cæsar" he puts an English translation far from their sight, that is the way I believe he puts it, in the back part of the book. For the first lesson he takes the first six lines of the first chapter of Cæsar. The pupils are kept at this until it is committed to memory. He reads and rereads it over for them, using the Roman pronunciation. He pronounces every word distinctly, giving every vowel its proper sound whether long or short, giving proper emphasis to the words or to sentences, as the case may be, that are emphatic. He then talks with those pupils asking them questions in Latin about the subject-matter of the lesson; they are compelled to repeat again and again these five or six lines of Cæsar. For the next lesson, and in this first lesson also, he would translate this Latin for them so they may understand the meaning of the words they have been learning. In the next lesson he takes another portion of Cæsar, and so on for about three months. He would require his class, in learning this Cæsar, to recite together or in turn every word they have learned, every day, until they have learned about thirty chapters. Now, of course, he meets an objection that he knows will arise in the minds of those who may be studying his method. "What about the construction of the language?" "What about the cases of substantives?" "What about

the moods of the verbs?" "When shall the pupils learn these?" He contends they will find these things out as they go along. This method will awaken their curiosity. They will have their curiosity so awakened that they themselves learn that the case that ends in *m* for instance, is a different case and has a different construction from a case that ends in *o* or *a*, or that a subjunctive following *cum* will be a different subjunctive from that following *ut* and they will find out all these things during these three months of learning this Latin with which he has been occupying his pupils. I am not here to say that Professor Sauveur is not able to accomplish such results. If he says that he is able to do that sort of thing, I am, of course, bound to believe him. But I am here to say that I cannot do that work in that way. That is not my method of teaching the Latin language. It seems to me that there is a different purpose in the teaching of the Latin and Greek, than such a method would seem to imply, for he would apply this same method to the teaching of Greek as well as Latin. We are not to lose sight of the fact that Latin and Greek are not spoken languages; that we cannot deal with them as we can deal with the modern languages; they are not taught for the same purpose. The real purpose for teaching Latin and Greek are those of discipline, culture and knowledge; the training and developing of the intellect; the becoming acquainted with the literature of the past, and the character and customs of those grand peoples that lived in other days, upon whose character and laws depends so much of what we enjoy at the present time; and any method that will best furnish this discipline and culture to the human intellect, seems to me the best method to use. Take for instance the matter of Latin. Here is a pupil that comes across, we will say, the perfect tense of the verb *dico — dixi*.

He sees that verb in that form for the first time. How is he going to know from what verb that form comes? Before he can know that, there are some other things that he must know first. If there are some other things that he must know first, when is he going to learn these other things. He must know that the verb *dixi* has a stem. That stem is *dic*, after dropping the final *e*. In order to get this form, there must something happen to that stem.

In order to know that, he must know just how to go to work. Pursuing a process of reasoning, he puts certain things together, the stem and the parts that go with it, in order to form a perfect stem. How is he going to learn that, according to this method? It seems to me that just in that sort of learning comes in a great measure the disciplinary power of the Latin language. Take the Greek language and see how it works there. Take the verb λήψομαι for instance. The pupil must know the present stem of that verb, and the laws of change in order to get that stem from the present form of the verb which he finds in the vocabulary. He must know that this form λήψομαι is made up from the present stem by means

of certain changes and additions following invariable laws that cannot be contravened in any way. If he is simply going to go through day after day, learning the text parrot like, having it translated in the back part of his book or by his teacher, which is just as convenient as an interlinear translation, when is he going to learn these things so necessary to know unless his attention is called to them as he goes along? It is a superficial manner of teaching Latin and Greek that ought not to obtain in our schools in this day. The premise upon which Dr. Sauveur proceeds is a false one. He asserts that the teaching of Latin and Greek has been and is a total failure; it is a waste of time, and unless somebody shall come to the rescue, Latin and Greek will be put out of our secondary schools and colleges. Any person of intelligence who may have studied the curricula of the different colleges, or the generally rising standard of education in this or other States, will know that this is not the case. The teaching of Latin and Greek is not a failure. I heard a man not long since whose hair is gray, who has lived a long time in this world, standing before a class of young ladies and gentlemen, a man of great intellectual force in this State, and especially in the city of New York. say that it was his conviction that the discipline that had been given him by his preparatory and college course in the study of Latin and Greek was of the utmost value, and if there was one thing for which he was more thankful than another it was that, in his preparatory as well as college course his teachers had been faithful to him in holding him to the drill of learning declensions and paradigms. This drill had helped his reasoning powers and enabled him to get a firmer grasp of complex questions. In addition to this came the benefit of learning to read the Latin and Greek languages. That was his testimony; and he is a man who is most worthy to be heard upon such a subject as this. And so it seems to me that the teaching of Latin and Greek is not a failure. If there be failure anywhere it is in the teacher. If we hold our boys and girls who may be studying Latin and Greek to these declensions, paradigms and euphonic changes, we are getting them into the habit of application in their study that will be worth everything to them. One purpose we have in educating the young men and women of to-day is to strengthen moral as well as intellectual fiber. Training a boy or girl so that he will consent to hold himself down to this legitimate drill day after day, through the preparatory course or the course in college, when he comes out, if the faithful teacher has inculcated in him moral principles, he has quite likely trained a man or woman who is able to go out into the world and do his part of the world's work as it should be done.

But I am not one of those who are willing to sit down and say, "my method is the method." I am not one of those who would put himself in a strait jacket and say, "this is the only position I can take." I am willing and am trying to learn. I am not one of

those who would prefer to be a loiterer in the great work of education, and thus "be behind the age." If there is a better way I mean to find it and follow it. I have been speaking of my own experience. I have never seen this "natural method" used even with the modern languages. But a most successful teacher of the modern languages tells me that he has used it, and has been forced to cast it aside because he cannot succeed with it. I have conversed with many pupils who have come out of the schools where this method has been used, and while very enthusiastic over the method, they really knew very little of French or German. While I may here confess that my own success has not been all that it should be, until I have been shown a better way I hardly believe I would be justified in giving up a method that has done so much for me, and has done so much for others, for another whose right of substitution is yet an unproved question. It seems to me that we should be a little careful with regard to these matters. Mr. Chancellor, reform is in the air; reform in politics, reform in religion and reform in education. It is all right.

I suppose a person would be set down as an old fogy if he did not say that it was all right. There are many things that ought to be reformed to be sure, but I tell you there are some old landmarks that ought not to be removed. Our fathers found out some things that are eternally true. Change itself, is not necessarily reform. While it is a fact that we should respectfully listen to the suggestions of those who have been successful along these lines, yet, at the same time, we should be very cautious about going into doubtful experiments. As was said on this floor yesterday, you may introduce these experiments that may be advocated by this one or that one, but you will notice that they are at the expense of the pupils. It is like the young physician trying to experiment upon the precious life of his patient. Unless we are fully convinced that we can use a method successfully we should be careful about adopting it. Let the method itself work its way, and if the individual is convinced that he can work it better than the one he is using, let him adopt it. That is the kind of reform I would indorse. As I have said, if any one will show me a better way, I will follow it. These gray heads before me will soon be out of sight. They are yearly lessening in number. They are, as it were, dropping this banner of education, as they are going on towards better things, and younger ones are picking it up and trying to bear it still higher; but my fellow teachers, I believe we should find out who has that banner in his hands. If he be one in whom we have the fullest confidence, who has himself succeeded, and can convince us that we also may succeed in the same way, then perhaps, we shall be justified in following him. I tell you I want to keep up with the procession; but if the procession is going the wrong way, I shall have to step aside and let it go on, even at the risk of being behind. If there is a person present who has successfully taught the Latin

and Greek languages, by the natural methods, I should certainly be very glad to hear from him. This is a very live question indeed, a question that appeals to the hearts and sympathies of a large number of those present. And I hope it will meet with the fullest and freest discussion. Is it better for us to lay aside the methods we have been using, and which have proven their right to exist, have shown themselves to be those that will get the best and most complete knowledge of the Latin and Greek languages into the minds of the pupils, and adopt the "natural methods," or a modified form of it, in their stead? I have spoken upon this particular phase of the question this morning, because I understood that Dr. Sauveur was to confine himself to the ancient languages, and because it was the one with which I was the more conversant.

Remarks of Principal D. C. Farr.

Mr. Chancellor, Ladies and Gentlemen — I wish that Dr. Sauveur were present this morning for two reasons.

First. That we might have heard his paper, and secondly that he might have been converted from his heresy, which I think there is reason to hope might have resulted from hearing the most excellent paper of Principal Sawyer.

The natural method of teaching languages evidently is founded upon a wrong principle, which is acknowledged by its advocates, viz.: that it is very easy for the student, but very hard for the teacher. If there is anything that, at the present day needs correcting, it is this; that the work of the school should all be done by our teachers, while the pupils are to be amused.

As well might a student expect to receive physical strength by his teacher's practice in the gymnasium as mental power by the labor of his instructor. The time has come when educators ought to insist that students should early learn to apply themselves steadily to their studies and be made to understand that that is the only method by which any real power can come.

The reason why language study has occupied so large a place in our system of instruction, has been because of the close and continued application which it required of the student through which he has been supposed to receive that discipline which he could not obtain as well from any other subjects.

Now, if the natural method is to prevail the classics must evidently be abandoned, since their value as studies depends so largely upon their disciplinary value and not upon their acquisition as a means of communication.

If the so-called natural method of teaching is to obtain to any extent, it will not be long before that worst of all educational heresies will be established that the object of our schools is to impart information rather than to develop mental power.

REMARKS OF PROFESSOR WILLIAM WELLS, OF UNION COLLEGE.

Mr. Chancellor and Ladies and Gentlemen:— It is not to me very clear what we are to discuss in this question here to day. I confess I am disappointed in not finding Dr. Sauveur here, for I very much desire to hear from him a clear and distinct exposition of the method he practices, apparently with a great deal of success. Some persons consider this a question in regard to modern languages; others seem to think it regards the ancient languages. I confess, so far as I am concerned, I cannot see very clearly what the line of this discussion is to be here, if we are to follow our paper. The time is now so far advanced that I don't propose to take much of it. I think it is best here for us to look at this question a little while in its purely practical character. What is the practical advantage of this so-called natural method compared to the scientific method, and of the efforts that are made by so many who undertake to learn to speak in one or the other of the languages. And so far as speaking is concerned, I have taken an interest in this natural method; I have watched it and the progress of it, and I see it growing largely. It is forming one of the subjects of education in our summer schools. I have not a very great deal to say against it, nor, perhaps, a great deal in its favor, yet, nevertheless, I have advised young *teachers* to go to those summer schools and obtain the advantage of this natural method; but not to begin with it. After having studied the scientific method, after understanding what language is, what its forms are, what its development and relative power of government are, in short, after being trained in the utensils, as it were, then let them go and get the practice of this natural method, those who want it. Considerable might thus be gained by it. I desire to be very practical in what I have to say.

Two or three years ago a very intelligent lady of my acquaintance presented to me her young daughter of fourteen years of age. She said she had been learning French by the natural method for two or three seasons, and said she, the teacher tells me there is no use of her undertaking to study by the natural method during the present season; "I have nothing more to teach her; she is perfect in the French language." Her father is an old teacher, a friend of mine, and he said to me, "will you stop in and take an opportunity to question my little girl in the French language which she has been studying; they say she is perfect in it; I would like to know what it means; I very much doubt it." Well, I stopped in. I had known the girl in her childhood, and I asked her several questions about her studies, but in no way as a pedagogue. I said to her, "You are studying French?" "Oh, yes, I have studied French some." "You read and speak French?" "Oh, yes," said she, "I read and speak French." Then I addressed to her, pleasantly, and not at all as a teacher or as though I was sounding her, a sentence in French. She shrugged her shoulders and did not seem to comprehend it at all. Then I said, "well you read a little

very likely," not letting her know that I was a pedagogue examining her with a view of telling her father of the success of the natural method that had made her a proficient French scholar. Well, she took up a simple French sentence and she translated that pleasantly. And she translated another one pleasantly. Then said I, "that ends in the letter *e*; how would it be in the second person plural?" Said she, "I never learned in that way." I said this word *déclare*, what is its infinitive?" She says, "that is not my way." Said I, "you have never learned that and you a young lady of fourteen," "why," says I, "that is very queer." She says "no," she was very innocent, "I never learned it." This perfect scholar by the natural method, as I live, did not know the difference between a nominative pronoun and an objective. She knew the word, but she could not move it out of that. It was just a sort of lumber sentence to fill her mind with for that one simple purpose. So much for that. Then again I have found a good many young ladies, especially, who make a good deal of progress in the so-called natural method, whereas I have sometimes found others who have worked and worked, until tired, making very little progress in our rational method of scientific college work. What is the plain practical reason? It is this: Give me an ordinary class of twenty-five pupils, and you will find five are trying to learn, and the other twenty are trying hard not to do it. The five will be honest in doing work without any one having to prod or push them. The college men for instance; how much time do they get to come to me in the course of a week, of a month or of a year. A gentleman here said the natural method was to talk to them four hours in a day, five days in a week and forty weeks in a year. Here is a great point to be considered, if by this method it is said such wonderful progress is to be made in presenting it to the classes in our colleges and academies. But go to these summer schools and whom do you find there? Ambitious teachers, real teachers who having one, two or three months are trying to become still better. I have seen some ladies at some of these summer schools working from dawn to dewy eve, but having learned a great deal in the first place, and then giving all their time, all their energy and, perhaps, all their health to it. It is natural that such persons should make a great deal of progress; and they frequently do so. These schools are generally frequented by these people who want to do it, not by those who do not want to do it. All they want is that popular practice. They want to listen and hear the sentence given. They want a community around them.

They are encouraged to do a great deal, and a great deal they do well, but to tell me that any pupil can go into any language and use it at the first lesson, it is absurd to talk that way. It cannot be done, and the colleges that are endeavoring to do such a thing step out of their line. The modern languages are largely introduced into our colleges as a means of training. That is the way we want

to teach them. I hardly ever undertake to have a conversation with my men. I want them posted up in all the grammatical forms and relations; without stopping to have the class in conversation, as the gentlemen said who just sat down. I say to them, I have done work enough; now I want you to do it. A German graduate said to me, of whom I asked, "What do you think of our pupils here throughout the United States; wherein do they differ from yours?" "Well," "it seems to me your young men or your boys work at their play and play at their work." I repeat: "Work at their play and play at their work." But said he, "our German boys work at their work, and play at their play." Now I put my foot down on any system that will help our young men to play at their work. Then as to this teaching Latin and Greek by the natural method, that is to hold up a finger and say, "Is that a finger?" And the answer is, "That is a finger." That may not be so bad in the modern languages, but to do it in Greek and Latin, may the gods preserve us from having anything to do with a thing like that. And then to teach the Latin and Greek like a living language. I have had a good deal of European experience. I have seen gentlemen introduced to the public who have gone before them and made their orations in Latin. I knew one who absolutely rummaged around an old book stand a few days to get a good book on Hippocrates because he wanted to deliver an address in medical Latin and he wished to get the style out of that book. I have met some Americans abroad who felt it all right when they came in contact with an Italian, or French, or German scholar, to start with some Latin expression, and if the Italian expressed surprise and asked them what they were talking, well they would say, "I am talking Latin." And the Italian says, "Oh! is tha Latin."

Then you must say so and so if you use the continental Latin. What is the continental pronunciation? We say Cicero, the Italian says Chichero, Spanish say Thithero, the French say Ceecéro, and the German says Kikero; now which of these is the continental pronunciation. If you call that the continental which the different nationalities impress upon the Latin with all their peculiarities, how are you going to get the continental pronunciation? The Germans have a full language, the French is a voluble language, we have a rich language. What is the use of trying to learn a dead language, as a living one? Why not reduce rather than increase the confusion of living tongues. I think the Hollanders are a foolish set to hold on to their own language. Nobody talks it. There are only a few millions of them. And those Bohemians who are trying to drive away the German, which is so rich a language, are doing a foolish thing, but they don't succeed.

A moment and I will close. I happened a few years ago to be chatting with a Roumanian. He was from Roumania, the only province of the Danube where the old Latin coheres, and the Roumanians are the descendants of the old Romans. They pretend to

speak the Latin tongue. I had heard a good deal of their speaking the Latin tongue among scholars. I went to a very practical man and said to him, "Do you really speak the Latin pure?" "Oh yes," said he. "How could you have kept it pure so long," said I. "Oh," said he "it is not so very pure." Then I recollected we speak of "Hog Latin," the Germans of "Kitchen Latin;" and then after conversing with the Roumanian I found that his Latin was "Hog Latin" or "Kitchen Latin." He said he could speak of anything in Latin, no matter what the subject was. I did not want him to speak to me because I knew I would not understand him, but I put him to the test. I sat in the office of a large iron works; an American had introduced a large locomotive works into Austria. This Roumanian gentleman was up there on the matter of having some American locomotives go down into Hungary. Over the large desk hung a handsome picture of an American locomotive. Said I, "Can you say everything in Latin that you wish to express?" "Oh yes," said he. Then, said I, "explain that locomotive in Latin. What are the steam whistles, the driving wheels, and piston rods in Latin? "Oh," said he, "that is a different thing." So it would be better if they had some pure cultivated language to apply to all purposes. I am a friend of the classics. For a man comes to me with a Greek preparation, does a great deal better in the German. I am not at all opposed to the Latin preparation, it greatly aids the study of the modern tongue. Some of the colleges of the country are endeavoring to establish a Greek academy in Athens. The French have been quite successful and the Germans, also, successful in that direction; but they tell us that one object is to teach our men the modern Greek. But what do our men want of modern Greek? If they expected to settle there and use it practically, then learn it; but to take men there and keep them there year after year learning modern Greek, with a view of practically using it, why when there are so many practical things to be learned. Everything in the line of our profession is growing, and we are complaining that we want more years, more decades, why then revive the dead languages on one hand and on the other to keep up these petty languages? This may seem strange as coming from a man who is a teacher of modern languages. But good time and good money are lost in trying to teach many simpering young girls to speak French and German, and Italian, and to keep them at it year after year is surely wrong. Send them abroad three or four years and they will come back cultivated; let them be here one year and they will forget what they learned of those languages. I don't advise dropping French and German, not at all. What I want is for every young man and woman to have a first rate scientific knowledge of the modern languages, and when the opportunity comes, then to use them, an opportunity which will give them the advantages whereby they can well use what they have had. In twenty pupils, not more than five

of them will ever want it. What is the use of the other fifteen learning, or trying to learn to speak them? They must lose the power when the thing is of so mechanical a character as the mere memory of languages. The main question is, what system will make the best men and women? What system will most thoroughly train their minds? What system will put them on the way when opportunity offers to use the instruments in their hands? It is not the natural system, in my opinion, by any means.

IX.

THE EDUCATIONAL USES OF MUSEUMS OF NATURAL HISTORY.

JAMES HALL, LL. D., Director of the State Museum.

Mr. Chancellor, and Ladies and Gentlemen of the Convocation.— I come before you, as I come always before an audience, with great hesitation, which I find it difficult to overcome. As I become interested in any subject, I sometimes forget myself, and thus forget the hesitancy which besets me on such occasions. I have listened last and the present year to the discussions on subjects connected with education. At the beginning of my life, I may say that I was in a very moderate degree helping the cause of education by courses of lectures, and if the chairman will allow me one minute — to the chancellor — will you allow me one minute to refer to the papers of yesterday and to the discussion, before proceeding with my own?

The CHANCELLOR.— Certainly.

I was requested by the chairman of the executive committee to give a short paper upon some subject which will illustrate the usefulness of the New York State Museum of Natural History.

I have heard discussions upon education, and methods of education, and last night I heard one gentleman speak of the boy as being superior to the curriculum. I see there is a tendency in that to recognize humanity as superior to any curriculum. I think the theory of Locke, where I remember having studied his philosophy of the human understanding — when I had very little understanding myself — was that all children are born alike, and that every child presents a character or a nature free from influence, on which any thing can be inscribed as upon a clean sheet of paper, and that all character and manifestation were due to education. Such were the illustrations given to us. I think the progress of science and the observations upon humanity have shown that no two children are born alike. Such a thing is not possible. Therefore, gentlemen, a curriculum for the education in school of boys and girls should be flexible, not changed into a rigid invention to torture them. Therefore, I make a plea for the children who are to be subject to the curriculum. Fifty years ago last month, I was taken from the quiet position I had chosen — one-half of the year for teaching, and one-half for study and travel — because my friends believed I could have a better position; but I go back

with pleasure to recollections of those days. I may say to you, gentlemen, who are teachers, that it is easy to discover the bent, the tendency or inclination, and the character of the boy, before insisting upon his submission to the curriculum. He will manifest his tendencies in a thousand things. Urge him forward, if not in a wrong direction, in those things which he shows a tendency to do, although it may indeed prove impossible to do them, owing to the nature of his constitution. Be lenient at least of that. I would advocate a flexible curriculum, which will bend to humanity rather than the Procustean bed which will insist on equalizing every stature.

I have brought down some specimens of workmanship from the Western Technical College to show Mr. Love, but I see he is not present. I am going to make only one remark in this connection. I think we were very much interested in his suggestions and propositions. I at least was so.

I will bring the subject before you in this manner: A gentleman of wealth and position said to me, "We have been a long time looking forward to something of this kind," that is the establishment of a technical school. "We have been sending our boys to eastern colleges. They come home educated, with their brain cultivated, but unfit to work with their hands. We cannot afford to let our western boys be educated, unless they are educated at the same time to use their hands with their brains. Therefore, we have established this institution that they may get practical knowledge, or, if you please, manual training at the same time."

In a few words I will endeavor to say something about museums of natural history in this State. A museum in its ordinary signification is not alone of natural history. The British Museum embraces every thing in art and nature and in the liberal sciences, all under the comprehensive title of museum. In natural history we go out of doors; we divide and arrange the elements of nature and give them a harmony we do not find. If you attempt to systematize and arrange the observations that you make, it becomes necessary to separate and arrange the material, not as you find it in nature, but by bringing out some smaller manifestations. In crystal organizations, or plant organizations, or all organizations which have a place in existence, they must be brought together, classified, and not left in the devious arrangement in which you find them out of doors.

There is a necessity of grouping in the museum of natural objects; of bringing the same kind together; and when we have combined these in a certain arrangement, which we call classification, we are then able to make use of the information derived from the study of these materials, in unraveling the difficult questions which are presented to us in nature. There is a certain order which we find has been established, both of relation and time. This order is preserved in our museums. We go into nature to examine whether we can confirm or dispute this, nature being the final refer-

ence in all cases. Museums, in some form, have existed through several centuries; but, in the beginning, these were not systematic museums, because they were begun without systematic arrangement.

I would say just here that in times past it has been considered necessary to make an apology for the existence of museums of natural history; or for the existence of collections, and for interest in these matters. It was so in this country as long ago as we began to collect specimens. One of our best men, as a statesman, was called an infidel because he was said to gather bones; and Mr. Bryant a long time ago wrote a poem to recall this.

But I should say of Mr. Jefferson's father that we owe to him, and perhaps to his far seeing knowledge, the present condition of the geological survey of the United States, and of the exploring expeditions which followed those which he sent out under our first explorers, Lewis and Clark. Hence resulted also the National Museum of Geological History at Washington. Judge Clinton — I beg pardon, for the name is always with me — Governor Clinton wrote many years ago that the State of New York should have a geological survey, and should establish a museum embracing the contents of its natural history. He himself thought it no degradation of his dignity to go upon geological excursions to the Helderbergs and elsewhere; and he brought back collections, mainly fossils and minerals, which, to-day, remain intact in the Albany Academy. Stephen Van Rensselaer, whose name is known to you as the Patroon, was connected with a European scientific college, and with scientific men, and had in his own house in 1831 and 1832 a large collection of specimens both from America and Europe. Intelligent men have always considered museums as important adjuncts to education.

But I have promised to be brief; I wish, therefore, to say only a few words in regard to the State Museum of Natural History. I must begin with the geological survey. The New York State Museum as it now stands before you, and fortunately it is likely to be cared for, is in a public building, while for many years its material has been divided between private accommodation and one public edifice entirely inadequate to contain it. This museum contains, in the first place, representatives of the collections made by the geological survey. It is, however, intended to represent every department of natural history, as you have heard yesterday in the paper on entomology; and more especially in botany; in the departments of geology and palæontology, we have numerous collections. It is intended that the mineral wealth of the State, in every one of its aspects, should be presented in the State Museum. The geological survey, organized in the first place to accomplish certain purposes, organized with the knowledge then possessed, was found to be inadequate in the original plan for carrying out the basis which had been proposed.

The tenure has been extended in one direction that the publications may be completed. This is in a fair way of being accom-

plished. The accumulation of material consequent on this work has left us with a large amount of duplicates on hand.

Ten years ago we distributed to the colleges and academies and normal schools of the State about twenty-thousand specimens. We are now prepared to distribute some five or six thousand specimens more. You may, therefore, appreciate the influence this has had upon education; you may appreciate the educational influences of the museum of the State. And it is certainly a desirable thing that we should in every way be connected with the educational interests of the State, both for our own sake and for the sake of the teachers, because the material which we send out, in whatever department it may be, has the authenticity of original investigation, with the names applied by those who are competent to give them. The schools receiving these collections receive that upon which they can rely; and although they may possess, perhaps, collections as good as those we send, yet the Museum, being under the direction of the Regents and the institutions also subject to their visitation, makes it extremely desirable that the educational institutions of the State should aid us and that we should aid them in everything concerning natural history in all its departments.

I may here mention a fact which I think some of you gentlemen know. Professor Ward of Rochester has organized a system of collections of minerals, rocks and fossils, which are furnished to the schools and colleges. And it is gratifying to know that these collections, representing the geological formations of New York and applying the nomenclature, have been widely distributed in the schools, and that the nomenclature which was established in the final publications of the Geological Survey is not only sustained in the text-books of the pupils, but also in the principal sources for furnishing such collections, as that of Professor Ward.

Now I will close by merely stating what we are doing in the State Museum at the present time. The distribution of the duplicate material upon which we have made our investigations will form for each one of your institutions a true museum; you have authentic specimens and labels and you are, so far as your material goes, as well prepared as we are here to instruct those who seek information. You have also the publications of the State Museum, and it is our purpose to continue, both by the publications and by distribution of specimens, to be an educational influence. It would be very desirable that more intimate relations exist between the museum and public teachers. Not that there is want of harmony, but those connected with the Museum find themselves so hard worked that they have no time to go abroad and talk to you in your institutions, as they would be glad to do. Therefore it is that only through this kind of communication can we come in contact with the educator; by sending collections, by giving information through our published papers in the Museum reports.

We have now fitted up in the State Hall several thousand

drawers and have selected material which was fit for final preservation in the Museum. This material will be so arranged that we can furnish to any institution similar collections or specimens when directed to do so by the proper authorities. The laws and resolutions which have been passed at different times are now condensed in one set, making the Regents responsible for these collections; and their order is sufficient to send out to any institution a collection from the specimens we have on hand. In wishing to make the State Museum a part of the educational system of the State, I have wished that there might be the most harmonious working, and with no impediments to original investigations by the professors or students in any of the institutions of learning in the State; and it would be an excellent feature if those men would have such confidence in us that they would send to us their communications and would seek our help in their investigations.

The records of the State Museum stand in such a way that in the future they may be referred to, and at all times, so far as we can see, for the next century, may be useful in the way of correcting error or helping students in the path of investigation. I say now, in the presence of men who are teachers, that if your pupils shall desire information we are ready to give it; if your institutions require collections of specimens to facilitate any work going on with you, we shall be glad to furnish them as rapidly as we can, remembering that our force is weak and there are few of us to manage and direct the vast accumulations and at the same time publish the results of new investigations.

For forty years the Museum has been established and it has held a responsible position under many varying circumstances during that time. I appeal to you to sustain this institution and to help keep it free from political influence. From the beginning of the Geological Survey politics have never entered into consideration anywhere. It would be an unfortunate thing if politics could sway the institutions of science. Political favoritism cannot advance science. Therefore it behooves the teachers of the State of New York and the Regents of the University to see that this institution, which now promises to have a permanent home, shall be kept free from all such influences. Thus it shall become a factor of teaching that is not possessed by any State at this time. Therefore I would urge you, finally, to help support this institution, and I ask it not for my individual sake, for a few years must end all I can do; I ask it for those who come after me, who must reap the benefit of all that myself and my aids have accomplished.

REMARKS OF PROFESSOR A. H. CHESTER, OF HAMILTON COLLEGE.

Mr. Chancellor, Ladies and Gentlemen. — It has been a great pleasure to hear from Professor Hall, who knows all about it, what the State has been doing in this connection, and of this opportunity for a more intimate relation between the geological survey and the

educational institutions of the State of New York; and it is my purpose in rising now to urge upon those who are entitled to them to seek and gain the collections which are offered; for it is my belief that the use of a specimen for illustration in teaching natural history is invariably of the greatest value. I have found it so, not only in teaching mineralogy and geology, but in chemistry as well. It is most important to bring in a specimen wherever possible to show it and speak about, and not only to show it and speak about it, but to allow the students to handle it, and so to examine it that they may gain something from seeing it. It is also of great interest and value to relate any historical point with reference to a specimen or set of specimens that may be shown, and to say that the collection shown is part of the collections of the geological survey, will always make it more interesting to students. I know very well in our own case that when the professor says with reference to a certain specimen of *eurypteus remipes*. "That specimen was figured by Professor Hall, in the State work onpalæontology you will find its picture there," it causes a closer examination of the specimen, and it is always of value in bringing about a relation in the mind of the student between the specimen and what he is to remember about it. I want also to urge the actual use of the collections now in possession of the academies. I have often spoken about a specimen and have been told, "Oh, yes, it is in the cabinet," and sure enough it was there, but so covered with dust as to show that it was never used.

Another point with reference to collections is that they should be scientifically arranged. It is not enough that the teacher should be able to find any specimen that he wants to show. The arrangement should be such that the student should be able to find it as well. Let the arrangement be a scientific one and in accordance with the book used. By this means the student is interested and being interested is able to gain more from the study of the specimens as a whole than he would if he studied them individually and without such arrangement. I urge this matter earnestly because in getting students from the academies we find many a young man who does not know what he wants to do. He does not know what he is interested in. He cannot tell whether he is interested in anything.

Such an one often finds out what he is interested in when he gets to the study of natural history. He might have been interested at the academy, and might have got his start a good deal earlier in the direction he afterwards takes. I urge this matter of the use of specimens now that we have had the offer made of collections that can be so readily obtained, because I believe the academies may often help us greatly in the work we are to do at college.

Remarks of Dr. N. T. Clarke, of Canandaigua.

Mr. Chancellor. — I do not think the teachers or the citizens of our State have any adequate conception of the greatness and value of the work inaugurated some forty years ago, largely through the influence of Governors Seward and Young. I refer to the preparation and publication of the Natural History of the State of New York. This work, as most of you know, consisted at first of some sixteen volumes, covering the different fields of natural history, to which others have been added, until now there are some thirty or more, with material enough all prepared for several more. Also, in connection with this work, the establishment of "The New York State Museum," which, when completed, will contain illustrations, properly arranged and classified, of every form of animal and vegetable life, living or extinct, with every rock, mineral, metallic ore or crystalline form that have existed in all this broad State.

The conception of such a grand work was left for New York first to enter upon and to carry out, and the original investigations carried on by scientific men, under the direction of the State, in every field of inquiry were so thorough and complete that in the geological field the classification adopted by them has not only become the acknowledged system of this country, but is regarded with admiration abroad. The Chemung, Hamilton, Niagara, Potsdam, Oriskany, Helderberg, Trenton and Genesee formations are known everywhere, and the New York system, of which they are a part, has become the foundation of all geological study of the western world.

Of the work which has been already done, and of that which is now being carried on by Dr. Hall, to whom we have just listened with so much interest, I cannot speak sufficiently in praise. I will only refer briefly to one or two branches of it. First, to what I will designate as the microscopic work of fossil life. By cutting fossil rocks into their sections and then grinding these sections down to transparent thinness the internal structure of the animal or vegetable can be determined with great accuracy, and so the types of ancient life are made manifest. Second, I refer to the lithographic branch of this work — the preparation of the forms which are to illustrate the coming volumes of this history. As I have examined this work I have been perfectly amazed at its beauty and perfection. I wish you could see, as I have seen to-day, the perfection of this work, which surpasses anything I ever saw before of this kind. When the museum shall be removed to the State Hall, as it is soon to be, and when it shall be arranged in order, as it will be, with the thousands upon thousands of specimens gathered up by Dr. Hall and his co-workers, it will be a museum unequaled anywhere in this country, and will be a pride to the State and a monument to the wisdom and public spirit of those who originated and have fostered it.

I know there is a kind of utilitarianism which cries out: What is the use of all these stones; what value is there in them, or in knowing anything about them. What is the use in knowing anything about anything? Why know anything about physics? It has put us in possession of the great mechanical powers of our time. What is the use of knowing anything of chemistry? It has manufactured many of the things we use for our sustenance and our comfort, besides unfolding the hidden wonders of the material universe. Are we to extend our knowledge only in the direction of food, clothing and shelter? Shall we not rather pry into the secrets of Nature and see something of the handiwork of the Creator. The granite that forms this magnificent pile is remarkable for its strength, and hence is fitted to bear the great weight which is placed upon it; but it has also an internal structure of wonderful beauty. If a scale of it be ground down and put under the microscope the quartz crystals, of which it is partly composed, will show a play of colors of surpassing beauty; and is there no value in the exhibition of this fact? The beautiful onyx, the gift of a sister republic, which adorns this magnificent chamber is none the less valuable because of its beauty. The whole crystalline world is a realm of beauty which fills the mind of the beholder with wonder and admiration, and neither the teacher nor the legislator can ignore the power of this element as an uplifting, purifying force in the education of our youth.

I am glad to know that one aim of the museum will be to send out collections of minerals and fossils, well arranged and labeled, to all the schools of the State, by means of which instruction in geology and palæontology can be made more thorough and satisfactory, and thus in other ways the schools will be made to feel the influence of the museum, with its vast and varied collections gathered from every field of investigation, in securing to our youth greater knowledge and culture than they have hitherto been able to obtain.

Remarks of Professor S. G. Williams.

Mr. Chancellor, Ladies and Gentlemen of the Convocation.— I think it is well that we should all of us heartily appreciate the significance of what has happened here to-day. When our venerable friend, a man whose name is illustrious on two continents, comes before this Convocation, to present his views, and to show the uses of the museum that he represents, and asks the teachers of this State, for their co-operation, I think it is an occasion of the very greatest interest. It has seemed to me many times, when I have met him, that by our frequent meetings, our very familiarity with him, we are apt to forget that the greatest of our scientific men now living has been speaking words to us, which are the results of the experience of half a century of hard, earnest and original work. I think all of us, ought to be very much interested in this

museum of our State. A service that the Doctor did not even allude to, is one that we, all of us, I think, may derive from it also. We talk sometimes about a man with a brick in his hat. I have some *stones* in my hat, that I have taken occasion to bring with me to-day, that I might have an opportunity of comparing them with specimens in this museum. They are a standard for comparison, not only in this country, but all over the world.

For the things that are represented here, they are the authentic standard. I have brought specimens, that I may have the opportunity, therefore, of comparison, with the authentic specimens in this museum. Some are possibly new things. I think they are. I hope to see my friend, and use the experience that he has gained during half a century and have him tell me whether they are really new or not.

But besides the services that we may derive from this museum, it seems to me, that we have services that we ought also to offer to the museum. I hope that we may have long, but we cannot, in the course of nature, expect to have always, the great advantage that Dr. Hall's experience presents to us of getting at the knowledge of what our rocks contain. And it seems to me that we who belong to the colleges and academies, should see to it that any new materials that our own separate localities may present should be sent here now and immediately, that the knowledge that may be derived from the larger study of the materials collected all over the State, collections more thorough than any single collector can make, may be made available when they are open to the advantage of the study of this largely experienced and very wise investigator in natural history.

I want to urge upon others what I have been doing, so far as I am able — sending all the new material I could possibly collect, to give to him and to the State, any advantage that might be derived from the study of it; and if anything is new, I want that something new to be described by him. I do not want to describe it myself; but have it described by him. I am more proud to-day to have in my cabinet the types of a very considerable number of fossils that have been derived from some of the rocks of Central New York, with his *imprimatur*, as it were, upon them, and with the little tickets pointing to their place in the natural history of the State, I am more proud of this than I would be to have described them myself. It seems to me that there is a very great and peculiar advantage in thus furnishing to the Doctor, at this time, those things which may perfect our knowledge of the natural history of the State, so far as palæontology is concerned. There is a great advantage in sending them *now*, that they may enter into the filling up and making as perfect as possible, those volumes of palæontology which are passing through the press, and which will be the finest monument the State of New York will have in the future.

Remarks of Principal F. J. Cheney.

Mr. Chancellor, Ladies and Gentlemen.— At the risk of wearying the Convocation I wish to rise to acknowledge my indebtedness to this collection of minerals and fossils that are being made here in the State Museum, and also to state to this Convocation what I presume every member knows already, the readiness with which Dr. Hall, together with the Regents of the University, will accede to any proper request that may be made for specimens to be sent to the various academies and union schools in the State. I know that the specimens which have been sent to us are of great worth. Of course what we say here to-day of any value must be said from our own experience. I believe we ought to speak from our own experience, at the risk of being called conceited. The value of any facts stated here depends upon this one thing: How have we been benefited? I know that the specimens sent to us from the New York State Museum, together with others that we have collected and classified, have been of great benefit in leading the pupil to make independent investigations for himself. The subject of geology becomes now interesting where before it was a thing of form, and aroused very little interest. It is now a very common thing for the boys to bring to the teacher specimens that they have gathered in the fields. Only the other day there was brought in as fine a specimen of a trilobite as I have ever seen, one a young man found in the field adjacent. An interest in the subject had been aroused in him by looking at the collection sent to us by the Regents. And we acknowledge our indebtedness to them. One thing more in the line of what Dr. Hall has done. It was my fortune a little less than a year ago to stand in the natural history rooms of the University of Edinburgh and look at the collection there. I had been through the museum here at Albany. Of course the specimens there were, as I could see, well arranged, but I remember that I could not help feeling something of patriotic pride when I thought that, because of the quiet but efficient work of a man who had made his name known on two continents, in this city of Albany, the capitol of the Empire State there was a museum better by far, with more specimens and more duplicates in it and better arranged than those in the great University of Edinburgh.

X.

SYSTEMATIC HABIT IN EDUCATION.

By Principal E. H. Cook, Potsdam Normal School.

Man is essentially a teachable animal. Kant says "man is the only creature that requires education." This feeblest of all creatures must be nursed for years with tender care. During this period of growth and development, habits are formed which, in a large measure, determine the success or failure of the life work. When returned from school, academy or college, to enter the great work of life, the question of chief interest to parent or friend is not just how much of mathematics, language and science they know, but what they are — what is their ability to grapple with the problems of life, and their power to solve them. We mean much when we ask the question regarding a young man or woman, "What is their ability for hard and earnest work?" Education may then be defined as character building, and by character I mean not simply those virtues which pertain to the moral development of man. By character I include physical conditions, mental powers and religious qualities. It becomes our duty as educators, whether as parents or teachers, to direct all of the energy of childhood so as to get the best results when the special work delegated to the period of school life is completed.

Man is sometimes spoken of as a bundle of habits. Custom, associations and early education largely determine these, whether they be good or bad, and it is often erroneously thought that it is easier to attain bad rather than good habits. It is certainly difficult to break a well-fixed habit, since the natural tendency of the human mind is to repeat its operations at given intervals.

"Habit at first is but a silken thread,
Fine as the light-winged gossamers that sway
In the warm sunbeams of a summer's day;
A shallow streamlet rippling o'er its bed,
A tiny sapling, ere its roots are spread;
A yet unhardened thorn upon the spray,
A lion's whelp that hath not scented prey,
A little smiling child obedient led.
Beware! that thread may bind thee as a chain;
That streamlet gather to a fatal sea;
That sapling spread into a gnarled tree;
That thorn, grown hard, may wound and give thee pain;
That playful whelp his murderous fangs reveal;
That child, a giant, crush thee 'neath his heel."

In order to conserve the time and energy of our youth, it becomes necessary that systematic habits should be carefully and

methodically formed. There are three phases of the subject that I wish briefly to discuss. First, systematic physical habits; second, systematic mental habits; third, systematic moral habits.

First. Systematic Physical Habits. — Good health is largely manufactured. It does one but little good to know the laws of growth and development, unless these are put in practice in the daily life. The laws of physiology and hygiene are but little understood and rarely insisted upon on the part of parents. Therefore, this work falls largely to the lot of the educator. As we stand at the door of a school and note carefully the physical condition of the children who enter, we are surprised at the number of those who show signs of weakness and physical disability. We see children with pale faces, hollow chests, slim bodies, weak arms and legs, with unnatural carriage and gait; and a careful examination of each develops the fact that they never have been accustomed to any systematic exercise or development. The parents, if carefully examined, show an almost utter ignorance of the habits and necessities of their children. These same parents often exhibit in conversation a remarkable knowledge of the characteristics and habits of animals which they have in their possession. They have studied the kind of food best adapted to produce bone, muscle and blood. This knowledge has been obtained by years of study and research. I remember on one occasion of conversing with a lady who, for a long period of time, had been studying the habits of the silk-worm. She could tell clearly and accurately the whole process of growth and development, from the tiny egg to the closely wound cocoon, and then the manufacturing of the silk into the beautiful fabric. Yet this same woman was very deficient in that most important of all information, how to aid Nature in her work of perfecting the human organism. A puny child was before her, her own offspring, and she acknowledged never having made a study of its needs, or what habits should be cultivated, that he might become, as he matured, the perfection of manliness in his physical nature, strong in every muscle and fibre, well fitted to do his own and a fair share of the world's work. A word here as to man's part in this work of rearing and training. Let him also be well informed in the methods of training the young, given us by the most enlightened and experienced, so that he may intelligently aid woman in that sphere where so much patience, gentleness, firmness, wisdom and love are required. It needs the masculine and feminine characteristics, acting together under divine control, to bring to perfection this wonderful physical organism of man.

All classes of the lower animals, that they may thrive, must be fed, cared for regularly; but children are allowed to grow up with irregular habits of sleeping, eating, drinking and exercise, and, as a result, we find many of them, when they enter upon the hard work of school life, totally unfitted, physically, for that which they ought to do with the utmost ease. They never have been taught

that good health was largely within the reach of each one of them. In my own experience, during a period of twenty-five years as an educator, I have found but few pupils who understood the proper care of the body. Many of the diseases of children and youth are produced by unintentional uncleanliness. It is a physical fact that nearly one-half of the waste matter of the human system passes through the skin, and I never have been able to understand why children are taught to wash their faces and hands frequently each day and the other parts of the body only occasionally, and some parts very rarely, if ever. The teacher should not forget that cleanliness is next to Godliness, and this fact should be impressed upon childhood until proper habits become a part of their nature. How much suffering might be avoided and how much happiness added if they were taught the proper care of the eyes, the use and abuse of the teeth, and the enjoyment of a sweet mouth.

Strength and a manly form can come only by systematic and judicious exercise. How to walk, how to breathe, how to sit, how to stand, how to carry the body, are as essential to the enjoyment of life as how to read, how to write, etc. All physical exercise should be arranged with a view to accomplish definite results, and, to achieve the ends desired, should be conducted at regular times. It should also be such as to develop those activities most liable to be neglected.

As we stand on the street corners and watch the passers by how rarely do we see a finely developed specimen of manhood or womanhood.

There is no subject connected with school work, which, if properly treated, will give results as satisfactory as that of physical culture. A half hour spent in good, systematical, physical exercise in the early part of the day, under proper conditions, adds much to the enjoyment of life and enables one to fulfill the duties of the day much more satisfactorily and with better results.

William Cullen Bryant attributed the excellent health that he enjoyed during the last forty years of his life to the regular and systematic exercise which he took every morning in the week.

Second. Systematic Mental Habits. — Several years since I became interested in examining the cases of children and youth who were withdrawn from school on the ground that they were breaking down from over work. The results proved conclusively, to my mind at least, that the instances are rare, if in fact any can be found, where pupils break down from too much work, but generally from a lack of system in their work and from irregular habits that produce nervousness and unfit them for mental labor. The mind to do good work in any given direction must be at rest as regards other work. The pupil who enters upon his study hour without a definite plan puts the mind at a disadvantage, and brings the nerves into a state of excitement. The tendency of the mind is to recur at regular periods to its customary work.

A student who sits down with a definite plan of work in his mind and a specific portion of time set apart for each department of study unconsciously finds himself mentally at ease and able to accomplish twice as much in half the time that he will if he sit down with his books before him and no definite time allotted to each line of work.

In the last condition he selects his subject for study and has no sooner entered upon it, than he begins to wish that he had taken one of the other studies, fearing that they may be harder to accomplish than this one. His mind is constantly disturbed.

It is a law of the mind that the adjustment of the attention is more easily settled to-day upon what is attended to yesterday at the same hour.

Newton remarked, and it was an old saying, that "genius is but continued attention." If this statement be true, and, who can doubt it, are there not many geniuses who are undeveloped from a lack of systematic habit in mental life.

> "What men most covet, wealth, distinction, power,
> Are baubles nothing worth; they only serve
> To rouse us up, as children at the school
> Are roused up to exertion. Our reward
> Is in the race we run, not in the prize.
> Those few, to whom is given what they ne'er earned
> Having by favor or inheritance
> The dangerous gifts placed in their hands,
> Know not, nor ever can, the generous pride
> That glows in him who on himself relies,
> Entering the lists of life. He speeds beyond
> Them all, and foremost in the race succeeds.
> His joy is not that he has got his crown,
> But that the power to win the crown is his."

A good mental education embraces two things. 1st. Value of the acquirements. 2d. Ability to acquire, gained by the acquisition itself. Many minds are satisfied with mere information. When this information becomes discriminated and assimilated, it becomes knowledge, and when knowledge is arranged and classified under specific laws, it becomes science. Many had doubtless witnessed the falling of apples previous to the time of Newton, and recognized the fact. It was not the falling of the apple that gave us the law of gravitation, but the attitude of Newton's mind trained to reason and think systematically.

Kepler gave facts which Newton reasoned upon. Every element of the Baconian philosophy can be found previous to the time of Bacon, but the systematic habit which Bacon had acquired enabled him to classify and arrange these facts in such a manner as to develop the new philosophy. All people have thoughts, but few people think and reason systematically. Systematic mental habit enables us to do things easily and simplify them in conclusion. A mind with this habit can grapple with new problems without shrinking. It is enabled to examine and judge if its work is cor-

rect. It will detect errors, it will lead us to discover new experiments and to determine their value. How few people read systematically. When they are through with a book, what have they gained by its perusal? Are they able to analyze the thought and to determine its place in the world's history? Science must be acquired before it can be applied, and no science can be acquired without habits of study. The mere facts of science do not constitute science, but a determination and relation of these facts to each other.

Mr. Griffith, the secretary of the British Association, once stated that he had found many boys who had read six books of Euclid but who knew nothing of geometry. Prof. Huxley says of the English boys "they study in these days not to know but to pass," and the consequence is that they pass, but do not know.

I think all will agree with me that a large amount of time, money and energy is wasted from a lack of systematic plan and unity in education. Systematic habit results in three great essentials of mental culture. — A. Careful observation. B. Clear reflection. C. Correct expression.

Third. Systematic Moral Habits.— We find at the present day a tendency in the training of youth to broadness with the interpretation, neither orthodox nor wise, that broadness means looseness in moral habits. There are certain religious ideas which should enter into the education of all youth.

I am opposed to dogmatic and sectarian instruction in our system of education, but who would object to the great teaching written on the forefront of the universe of the fatherhood of God and the brotherhood of man. The central idea of all moral or religious education is love; love to ourselves, love to our fellow beings, love to our God. This idea should form a part of the every day education of every child life.

Another element that should form a part of the instruction in school life is self control, which can only be acquired by careful, persistent, charitable and faithful training.

Example is much more powerful than precept in developing these moral qualities. The old Latin motto "*Verba docent; exempla trahunt*" (words teach; examples draw), has a peculiar significance. Children should be taught sympathy, regard for the feeling of others, the necessity of self sacrifice, in fine, to live up to the highest light which they possess each day of their lives; it is not what they know to be right, but what they do that will determine their position and success in life.

To sum up briefly, for I cannot do justice to the subject in so short a paper, I would strive to lead my pupils (as I do in our own school), to divide each day into three parts, eight hours for sleep, beginning and ending at a fixed time, eight hours for recreation, rest and recuperation, and eight hours for study and recitation, with a definite time set apart for each department of work.

Such a division of time carefully tried and rigidly adhered to, will save time, strength and worry, and give us a stronger, healthier and happier class of people in the coming generations.

Remarks of Principal Joseph E. King.

Mr. Chancellor, Ladies and Gentlemen of the Convocation. — In addition to the excellent habits recommended to be secured in our pupils, it occurred to me while the paper was before us, that as applied to ourselves, systematic habits, the right system of habits in the teacher will come to have this delightful effect. You will by and by become aware that you have been laying up an endowment fund for old age upon which you can assuredly draw. If in the teacher there has been a habit of promptness in his youth, no one will think of him as an old man by and by because he will always be prompt. If there is a habit of holding his class to the lesson first, before wandering all over creation as it is proper to do later, the ingenious pupil who will seek to avoid the recitation, will be baffled in his attempt to set the old man talking before the lesson is recited. If there is a habit of vivacity that has either been naturally developed or superinduced by attention, you will find the teacher, advanced in years, to have lost his attractiveness and his efficiency, no more than the successful, mature lawyer. Nobody thinks of being cautious in going to Senator Evarts with a retainer to take his case, for the reason that he is an old man far along in the seventies somewhere. Nobody thinks of that. Why? Because the habit of his alert young manhood is upon him, and he is drawing upon the endowment fund of a right system of habits.

It is a great mistake for men in public life to grow old prematurely, and I suspect, if the instructions of this admirable paper could have been timely available to some of them, they might be more effective in their sixties and seventies than they were in their thirties and forties. Morally it is a very blessed thing that we can have the power of habit if we will, to hold us to the lines of virtue; that we shall behave ourselves to-day because we are pushed into it by the momentum of yesterday. I have this beautiful illustration of the habit of affection taking the place of passion. I confirmed it by inquiring of the illustrious daughter of the illustrious man to whom I refer — Thomas Benton. We have known him as a stern hard man and a hard fighter, as an ardent friend and a tremendous hater. Some of you don't know this. When in his seventies, still a senator, he was engaged in writing his "*Thirty Years in the Senate*," he came home one night to find that his equally aged wife had been stricken with paralysis. She was speechless but she knew him, and with a wistful eye turned towards him; when he touched her hand he saw it gave her pleasure; and thereafter month after month and year after year while he was writing these volumes, this stern, hard man from whose blood the fires of conjugal passion had long since gone out, by the habit of the affection of a lifetime, could sit by

the hour caressingly holding her palsied hand with a loving grasp while he was writing the "Thirty Years." The power of habit thus God brings in to supplement our waning energies.

REMARKS OF PROFESSOR OREN ROOT.

Mr. Chancellor, Ladies and Gentlemen of the Convocation.— I was pleased, as were all of us, with the paper. But I regret that the author did not enlarge a little on definite practical suggestions near the close of his paper. I believe in the three-fold division of time as it suggested, but it has seemed to me that a three-fold division was hardly applicable in very many cases. I think that this notion of system in our mental as well as in our moral application should be carried into detail. I do not believe that there are any grand principles that cannot be made definite and practicable. They are about training the giant force of our Niagara so that it shall not merely be a source of delight in its grandeur for the continent, but that it shall be valuable in its power, and by and by they will so arrange it that that giant force shall turn the spindles that shall weave the gossamer threads for our wearing. I think we should so inculcate this notion of systematic habit that our boys and girls, young men and young women, in their school work, and because in the school work, therefore in their future lives, shall have this system in detail. Some twenty years ago in talking with two teachers then under my control, who claimed that they had not time to do divers and sundry things which they desired, I put to them on the instant the question, "How much time is there in twenty-four hours?" And when they looked somewhat aghast at what seemed the folly of my question, I pressed the question upon them. "How much time is there in twenty-four hours, I want to know?" I followed that question, but by detailed questions as to how much time there was given for slumber and for dreams, how much time for the various requirements of their lives, how much in the school room, and I tried to bring them down to how many minutes in every day they could not account for. I think they were somewhat surprised to find that there were nearly four hours of every day of their current lives for which they could give no account at all. Now four hours is a fair fraction of the twenty-four, and those two earnest young women were simply losing about one-sixth of their daily lives, running out into what was apparently, so far as results are concerned, nothingness. It is just as it is with our dimes and quarters. Extravagance is not in paying out hundred dollar notes. At least the extravagance of the college professor is not in that line. We do not have enough of them. Our extravagance is in paying out dimes, nickels and quarters. And it is exceeding hard work to keep track of them. We only know there is a deficit at the end of the year. This systematic habit in our study and our work should be in some way so inculcated that

it shall touch the minutes as well as the hours. Of course we cannot give any definite rule.

I cannot say to the boy "A," who is in Hamilton College to-day, you shall study Greek from such an hour to such an hour, and Latin so and so, and rhetoric so and so, because the rule for to-day is not the rule for to-morrow. We must train scholars that they shall be judges for themselves what shall be the proportionate time to give to each and how their system shall be. With reference to this there is one thought which came to my mind with regard to the study of our pupils, not only as to their giving a fair proportion of time to certain definite work, and certain definite play, but that this portion so given shall be in itself rightly arranged. The old notion of cart first has not gone out of date yet. There are plenty of carts ahead of the horses in our education as everywhere else. The difficulty is that they go slow. I do not know what could be done better than to give to our students the notion that they are to make a systematic division of their time and bring that notion down to the subdivision of time itself. I have found that recitations and study are not like muffins. The are not best served hot. They are better when they are grown cold. One-half an hour of work given, with time after for the action of the unconscious digestion, is better than a whole hour given just before going into the recitation room. I see boys come to my recitation room, taking, when they come to the door, a last fond lingering look at some problem in trigonometry, and I know that look is not getting much good for the boy. He should think about it; he should have time so that he can come to the recitation room without the book and he can draw out in the room the formula or the solutions of his studies. That can be gained by systematic arrangement of study, and a portion of time assigned to it. The boys should be so taught to study the subject of their task that there shall be opportunity for their own mental power to act upon the subject. That is work digested. There should be two things before them. They should have an assignment of time first, and, second, this assignment of time should be so arranged as to have in it the logical sequence, first learning and then thinking. Each portion of the time so arranged will give, it seems to me, an increase in the value of the study hours for all of our pupils.

Remarks of Instructor A. White, of Cazenovia Seminary.

Mr. Chancellor, Ladies and Gentlemen of the Convocation. — The last department presented in this essay, appears to have been not sufficiently discussed. There is one habit more important than all those which have been mentioned, and that is the habit of *telling* the *truth*.

There are students who habitually cheat if they can. For a proof that this is so understood, consider the way in which our examination papers are made out, and observe with what guards they are

surrounded. There are good students, truthful and conscientious, but there are also students whose habit is to falsify everywhere. The number of these students is large, and they manage to create a sentiment which supports them in this habit of falsehood. That sentiment, expressed in words, would be somewhat like the following: "The moral law has no application to us in our relations to teachers; if we can deceive the teachers, all right; we are students, and are not required to *tell* the *truth*."

Now I believe that a student who grows up with the habit of deception in him, will carry it with him through all his life. I believe that he is lacking in one of the essential elements of a *man*. There may be teachers, also, whose practice toward pupils is a little tainted with dishonesty.

If a man has told me a deliberate lie — suppose that he is a student — if I *know* that he has told me a deliberate lie, can I ever have confidence in that man when grown up? Could I trust him with my business, if a lawer? Would I go to hear him, if a preacher? Would his preaching do me any good? It does seem that there are some men who cannot do good, for the reason that they have no solid character.

No question pertaining to school management is more important than this. How shall we revolutionize that vicious sentiment? How shall we cultivate and strengthen thoroughly right moral habits?

XI.

SHOULD GEOMETRY BE TAUGHT BEFORE ALGEBRA?

By Principal C. T. R. Smith, of Lansingburgh Academy.

It is impossible, to be sure, to frame a course of study for the secondary schools of this State, that shall satisfy every one. There are too many kinds of schools, the needs and the circumstances of the students vary too widely, the views and the favorite branches of teachers are too different. Yet there are probably few principals who do not feel certain that the lines of study suggested by the regents and made the basis of the award of certificates and diplomas, have been of great service. Both pupils and teachers find their ideas of the scope of academic work broadened and their tendencies to specialties held in check. Secondary teaching in New York State aims more generally at producing a well-rounded mental development than before the regents' course of study was instituted. Especially is this true in the 222 academies and union schools having less than seventy-five academic pupils each. The great high schools of the cities are not so much in need of the stimulus of the regents' examinations and the checks and guidance of the regents' course of study as the smaller schools. If any discrimination is to be made in satisfying their respective wants it should be in favor of those that most need this stimulus and oversight. For the State to do otherwise would be as unjust as for a teacher to neglect his younger and less gifted pupils and frame his rules and his program chiefly for the benefit of those whose talents or advantages would enable them to go on rapidly without his assistance.

Without doubt most of us will agree as to the excellence of the present regents' course of study. It was originally prepared by men of rare qualifications for such work. It has been revised from time to time after consultation with some of the best teachers in our ranks and has been improved with each change. There ought to be a degree of permanence about such a schedule after it has been in operation for years and schools have become adjusted to its requirements. Changes should occur only after the most careful consideration of all their probable effects. Nevertheless, I venture to propose for your consideration one change, which I have thought for several years would be an improvement.

To see the reasons for the change proposed it is necessary to consider briefly the uses of mathematical studies and the principles which should regulate their sequence. Perhaps their most import-

ant use is to give the power or form the habit of continuous voluntary attention. As to the importance of this power there can be but one opinion, and that opinion cannot be better stated than in the words of that prince of American teachers, the man whom President Garfield so delighted to honor, Mark Hopkins. In the course of an address last week marking the fiftieth anniversary of his appointment as president of Williams College, Dr. Hopkins used these words, in defining the expression "a disciplined mind:" "By this I mean" said he "a power of concentrating attention for a long time on one subject. I do not mean the power to hold the attention thus on some one subject to which the person may have a bent, and to which the tendency may become so strong as to mount the man on a hobby, or to become an insanity, but I mean the power of so commanding the mind as to be able to give concentrated attention to any subject when it is required. Only thus can there be profound thought, only thus can all the relations of the subject, within and without, be seen. Now this power of concentrated thought which Dr. Hopkins described as the one essential of mental discipline can be obtained by few, if any, other studies so thoroughly as by the study of mathematics.

Another effect of such study is to exercise and strengthen the faculties employed in demonstration and make the mind quick at detecting fallacies. In other lines of investigation the mind is largely, if not mainly, occupied in establishing the premises of its reasoning — the facts on which reasoning is based. But mathematical demonstration has nothing to do with facts or with anything that actually exists. It begins with a hypothesis and proceeds to a conclusion that is necessarily true, true without a doubt. Hence, many metaphysicians have decried the study of mathematics as a discipline for the mind, claiming that, in the words of Sir William Hamilton, "by it we are disqualified for observation, either external or internal, for abstraction and generalization, for common reasoning, nay, disposed to the alternative of blind credulity or of irrational scepticism."

No one would claim for the studies in question that they discipline the ordinary powers of observation and perception by the senses, but there is a kind of observing power which they do cultivate—the power which perceives *relations* among ideas and thoughts. The importance of exercising and strengthening this power, I think, no one will be disposed to deny. Certainly habits of close thinking and of looking out for fallacies are engendered by mathematical studies and these habits are among the most valuable which school training can give.

A third advantage is that well conducted recitations in mathematics give to the student habits of precise expression to a greater degree than recitations in most other studies. The ideas which form the subject-matter of these recitations are usually capable of precise definition, and for each there is a particular expression — a

word for each idea and an idea for each word. If the teacher is careful to point out the absurdities of mathematical expression into which the student is led by loose statements and bad diction, and to tolerate no ambiguities in recitation, valuable training in the clear expression of thought must accrue.

Again, good comes from the studies under consideration, in that they tend to develop the creative imagination — the inventive faculty. Let me illustrate, for perhaps some would smile at the idea of training the imagination — a faculty generally supposed to find play in art and poetry — by the study of arithmetic, for instance. Once I heard a lesson given by a careful teacher in this way. The class had finished the study of square measure, and the lesson was intended to introduce to them cubic measure. The teacher showed a block from a box of geometrical forms. "Of what shape is this block?" said he. "It is a cube," was the answer. "Now I want you to imagine a larger cube; imagine it as long as this foot-rule, and as wide, and as thick." He turned the rule vertically and horizontally in the air to make it represent three edges of the cube in succession, as he spoke. "Can any one tell what you might call such a cube?" After a moment, as no one responded, the teacher said: "I think you might name it from its length." "A foot cube," one boy suggested. "Well, we will call it a foot cube. Now I want to find out how many such foot cubes could be packed into this room. We will begin by imagining one foot cube down there in the corner on the floor, and another placed beside it, and another, till we have a row as long as the room — how many foot cubes would there be in the row? How can we find out? Each would extend one foot along the base-board, you see." "Measure the base-board," said several pupils at once. "Well," said the teacher, producing a measuring tape, "John and Henry may measure it, and Alfred and George may measure the opposite base-board with this yard-stick, and we will see how you agree." The wall was found to be forty-eight feet five inches in length, and it was decided that there would be forty-eight and five-twelfths foot cubes in the row. Then the teacher asked the class to imagine another row of foot cubes beside the first, and others still, till the floor was imagined to be covered with foot cubes, and the number of them calculated. Another layer was imagined resting on the first, and another on that, till the room was imagined full of foot cubes, and the answer to the teacher's original question was computed on the black-board. By a similar process of imagining, step by step, and measuring and computing as they imagined, the class were taught to find out the number of inch cubes that could be packed in a box that was shown. Then the relation of the terms foot cube and cubic foot, inch cube and cubic inch was explained, and a lesson for the morrow was assigned.

If those boys, thought I, as the class was dismissed, shall have no power to invent ways of accomplishing work and surmounting

difficulties when they come to the business of life, it will not be the fault of the teacher. What is invention but the action of the imagination placed under limitations — Pegasus harnessed to the plough? The most complicated piece of machinery must have existed an "airy nothing" in the mind of its inventor before it was realized in brass and steel, and what was the process of inventing it but the step-by-step action of the imagination under limitations? It is my belief that it is simply because this kind of mental power is so little exercised in other studies, and in the ordinary thinking of young people, that the majority of students find geometry and applied mathematics difficult. It is as when one learns to swim. The motions of swimming require comparatively little muscular exertion, but because the muscles employed are those which receive little exercise otherwise they are usually weak and undeveloped, and the man who could walk forty miles without great fatigue is exhausted in swimming forty rods. So the inventive imagination needs to be developed that the man or the woman may be fertile in expedients for doing life's work and for meeting life's emergencies. Few if any other studies afford such satisfactory exercise to this end as certain departments of mathematics. Indeed, who can tell how much of Yankee ingenuity is due to the much berated prevalence of arithmetic in Yankee schools.

Another faculty that needs training is the power to form general notions and comprehend general principles. True, this may be obtained from most other studies, if rightly presented, but scarcely any other studies exercise this power so fully or so constantly as the pure mathematics.

Now, if to the educational uses which we have considered, we add the practical value of mathematical attainments in the business of life (though doubtless this value is often exaggerated), we shall be convinced, I think, that these studies ought to continue to be a main feature in our courses of study.

Let us now consider the principles which ought to guide in determining the right sequence of the studies of any given department. In the first place it will probably be admitted that branches which appeal to the senses and imagination and are capable of illustration with visible and tangible objects, should be studied before those which appeal mainly to the faculties of abstraction and generalization. This seems to be the order of nature. The latter faculties are comparatively late in development, and in untrained minds they are often scarcely developed at all. Some philosophers have held that the possession of these powers is characteristic of the human mind as compared with that of the brute. Be that as it may, teachers and metaphysicians agree that studies which appeal mainly to these powers should be placed late in a course of study.

Another consideration which should guide in arranging studies is this: A branch which aids in understanding another branch should, if possible, be studied before that other branch. If two branches

are mutual auxiliaries, that one should be studied first which is most helpful towards understanding the other.

Again, in view of the fact that many pupils leave school without completing the course, those branches which are most valuable for mental development or which, to the average pupil, are most likely to find application in the affairs of life, should be introduced as early as possible; while at the same time, there should be regard to the symmetry of mental development; that is, no one kind of training should be abnormally pushed at the expense of the entire neglect of a kind of training equally important.

Lastly, monotony should be avoided as far as consistent with more important considerations. The line of thought which has been pursued for years becomes tedious to the pupil, and he will accomplish more and better mental work with fresher mental pabulum.

From all these considerations, it is my opinion that plane geometry ought to precede algebra in our courses of study and exchange places with algebra in the requirements for the regents' intermediate certificate.

The ideas of geometry are capable of concrete illustration. With a little labor and care at first on the part of his teacher, the pupil may be made to see "with his mind's eye" the angles and the forms of which he speaks and reasons. He can compare them for himself and discover relations not shown him by his text-book. The methods of work are very different from those to which he has been for so many years accustomed in arithmetic. Though the rigorous demonstration exacted is new to him, if the teacher is careful and the text-book well chosen, he soon becomes familiar with the methods of geometry, begins to appreciate the perfection of its logic, and pursues the study with increasing pleasure and enthusiasm. The ideas of algebra, on the other hand, are pure abstractions, abstract numbers and abstract relations of numbers. Probably the pupil learns to perform a sort of jugglery with a, b, c, and x, y, z, and rests content. The equation is to him a kind of mill. He puts in an x, turns the crank of transposition, etc., and the answer drops out. Under my observation, pupils who have not studied geometry rarely comprehend any but the very simplest demonstrations of algebra. They memorize the definitions, learn to "do" the examples in a mechanical way, and that is nearly all. Those who have studied elementary geometry before beginning algebra are able to appreciate the force of a chain of reasoning and carry these steps in the mind. They therefore readily comprehend the theorems and demonstrations of algebra and perceive the logical force of a series of equations. They get from the study all the discipline that it can afford, while to those who study algebra first, it is in many cases almost a waste of time. As these do not learn to appreciate the force of a chain of reasoning, they are little better prepared to begin geometry after having studied algebra than when they left off arithmetic.

Moreover, as we have seen, the more useful study ought to be pursued first, if the pupil is prepared for it, because many pupils do not finish the course. The elements of geometry are more useful than the elements of algebra in all but one of the six uses which we have enumerated, for mathematical studies. Geometry is better for forming the habit of continuous and undivided attention. The young student soon learns that during a demonstration, whether he is studying it, or reciting it, or inventing it, to quote words that have recently become tolerably familiar to some thousands of young people in this State "if his wit be called away never so little, he must begin again." In elementary algebra, much of the work is of a more mechanical character, mere ciphering, and after a little practice can be performed without that concentrated attention which it is the especial province of mathematical training to make habitual. Geometry, more than any other study, brings into constant use the mental powers which are employed in demonstration, and makes its students apt in perceiving the relations and interdependence of truths. In fact, I am convinced that many students obtain from it their first ideas of what a demonstration really is. Otherwise why do so many at first attempt to memorize demonstrations, although they may have studied higher arithmetic and algebra for years? If they really comprehended the nature of the logical process, they would see the absurdity of such expenditure of mental labor before the teacher could show it to them. Even in the study of geometry, a pupil may be allowed to miss almost all benefit, by a careless or an incompetent teacher. Some years ago, I was asked by our school commissioner to conduct the examination for the State scholarship at Cornell University. Among the candidates was a bright girl who answered well in all the studies till we came to geometry. I asked her to prove that if a line intersects two parallels the alternate angles are equal. She looked puzzled and finally replied by repeating the theorem and two corollaries. "Yes," said I, "please prove it. Give the demonstration." A dazed expression came over her face, and there was an awkward pause. At length I said "just draw your figure on the blackboard, there, and make it appear that your proposition is true." "Why, we never did that," was the reply, "we used to learn the parts that were printed in italics and recite them." "But did not your teacher require you to give the demonstrations?" "Why, no; she used to ask us if we understood it, and if we didn't, she would explain it to us." It is needless to add that the school where such instruction was given does not use the regents' advanced examinations. The incident shows that it is possible to make even geometry a mere exercise for memory.

As to the comparative value of a knowledge of geometry and of algebra in the pursuits of ordinary life, there can be no question. Some years ago an engraver came to me and said, "I want my boy to learn geometry. I can tell by an engraver's designs whether he

has studied geometry. It gives him an eye for form." A tinner said to me, "my boy has got through the grammar school, and I can't afford to give him a full course, but I want him to study geometry. I had to learn it evenings after I had learned my trade, and I could not learn it thoroughly, but he shall have a chance to know it well." And so it is. In the arts of the builder, the pattern-maker, the designer, the machinist, the farmer, not to mention the navigator, the surveyor and the engineer, a knowledge of geometry is of great use, while algebra, though indispensable in the higher departments of architecture and engineering, is seldom needed for the practical purposes or ordinary life. The former might be very closely associated with the manual training, of which we heard such an exceedingly interesting and suggestive account in the session of yesterday.

When we compare the two sciences as tending to secure precision in thought and speech, we find that the terms of no other science have such definite meanings and require such precision in their use as those of geometry, and at the same time the language of geometry seems to approach more nearly to the language of common life and to be more readily intelligible than the language of algebra. As a means of training the mind to habits of perspicuity of thought and expression, and, what is nearly the same thing, of fully comprehending the thoughts of other minds when expressed in terse and perspicuous language, we find the latter science, therefore, considerably inferior to the former.

Finally, as a discipline for the inventive and constructive imagination, that great thinker upon education, Herbert Spencer, says of that kind of exercise for boys and girls, to which his father, a most skillful and enthusiastic teacher, gave the name of "Inventional Geometry:" "To its great efficiency I can give personal testimony. I have seen it create in a class of boys so much enthusiasm that they looked forward to their geometry lesson as a chief event in the week. And girls initiated in the system by my father have frequently begged of him for problems to solve in their holidays." But we need not go abroad for testimony on this point. Probably no teacher who has felt or witnessed the effect of solving well-chosen geometrical problems will hesitate to declare his belief that geometry greatly surpasses algebra as a means of developing the power to invent.

The six uses of mathematical studies which were mentioned seem to me nearly an exhaustive classification of the good results to be expected from these studies especially. For five of these uses, geometry seems to be more efficient than its sister science. For leading a student of sufficiently mature mind to form general notions and comprehend general principles, algebra is doubtless the better.

It would seem, then, that in the regents' course of study, geometry ought to be the study to follow arithmetic. Only two objections occur to me. It may be said that in the text books generally in

use mong us, the treatment of some propositions in geometry presupposes a knowledge of the transformation of the equation. But these transformations are easily justifiable by the axioms which belong as much to the one science as to the other. In fact the transformations are likely to be more perfectly comprehended when taught as a part of a demonstration and justified by axioms than when taught independently. It is only necessary that the teacher should guide the pupil, a little at the right time, in tracing the dependence of the processes.

The other objection is that pupils in our graded schools who have just completed arithmetic, are not old enough to study geometry. It might be replied, "then they are certainly too young to study algebra, for the metaphysicians are agreed that the powers of abstraction and generalization, on which a comprehension of algebra depends, are the last faculties to be developed." Of course children may be taught to go mechanically through the processes of algebra, but there is about as much mental discipline in it as there is in turning a grindstone, and as not one in one thousand of them will ever use algebra for any practical purpose, where is the good? Furthermore, as I ascertained by ciphering a little while in the regents' office last week, the average age of 759 pupils who obtained the preliminary certificate last June, in the first fifty schools on the regent' list, was fifteen years and four months. Even in the city, where the immediate presence of our legislators, or some other cause, is supposed to render the children somewhat precocious, the average of those winning preliminary certificates was nearly fourteen years and seven months. Surely, children of this age are able to comprehend geometry, if properly presented. In the union schools and academies the average is still higher. The twenty-eight schools of which the names begin with C, gave an average of sixteen years and five months.

This plan of teaching geometry before algebra is not an untried scheme. My attention was called to it by a paper presented to this body in 1881, by Professor Safford, of Williams College. On reading a very lucid and valuable paper presented to the Convocation of 1867, by Professor William D. Wilson, then of Hobart College, "On the Nature and Method of Teaching Mathematics," I found that he had been taught on this plan and seemed to approve of it. It is true, that both these authorities favored intermingling the two sciences or rather teaching parts of the elements of each alternately, but that seemed to me impracticable for various reasons, among which was the want of a suitable text-book. I tried the experiment of teaching geometry first, liked it, and have kept it up for five years with increasing satisfaction, except that my students do not get the intermediate certificates until they get the diploma. That this inconvenience may be removed and may not hinder principals from trying a plan which has so much to be said in its favor, I earnestly recommend to the Regents that while

retaining both plane geometry and elementary algebra as indispensable studies, they permit students to present either for the intermediate certificate, reserving the other for the diploma.

Remarks of Dr. N. T. Clarke, of Canandaigua.

Mr. Chancellor, Ladies and Gentlemen of the Convocation.— While I have been pleased with the tenor and spirit of the paper, I find myself unable to agree with the conclusions reached, namely: The desirableness of placing geometry before algebra in a philosophically arranged order of study.

As a member of the committee appointed by this body, some years since, to arrange a course of study for the higher examinations, I thought then, as I think now, that the true logical order is as we gave them — algebra, the simplest, first, and then geometry, the more difficult.

I remember that one of our distinguished college presidents, of strong mathematical tendencies, used to say: "Geometry is eyes, algebra is fingers." Geometry presents a series of facts or truths. Algebra invents the processes by which these facts are proven or applied. Algebra stands more nearly related to arithmetic than geometry. Its operations are like those of arithmetic, in fact, in one sense, identical with them, while geometry is further removed and has no real connection with arithmetic, properly so called.

Now, to cover the whole field of algebra or geometry, I am free to say that the latter is a much higher study than the former, as its abstract reasoning is higher than the simple problem — working methods of algebra.

It is true that even a child may get some knowledge of geometric forms, as he may of algebraic equations. But the paper does not discuss the subject in reference to him. And I am clear in my mind that neither branch should be touched by any pupil until he has well mastered his arithmetic. I may have, and probably do have, a higher view of the study of geometry than many who have taught it, but after an experience of more than forty years in mathematical instruction, I am satisfied that the best scholars are made by giving them at least a term's work — two terms would be better — in algebra before they enter upon the higher and more difficult demonstrations of geometry. I regard geometry as the grandest branch of mathematical science, and its demonstrations instructive, and in logical order models of pure argument. There is the enunciation of the fact to be proven; the statement of the case; the argument in its order, and the conclusions reached, and the intellectual equipment for such work, done as it should be, is of a higher order than for the corresponding, or even for some of the higher work in algebra. In both of these studies there are difficulties of great magnitude to elementary scholars, as there are many things of easy comprehension.

I call to mind, that once on this floor the late Professor Charles Davies, a most accomplished mathematical scholar as we all know, read a paper upon the infinite expansion of the polygon in becoming a circle, and that the venerable Dr. Wilson, whose cheerful presence greets us to-day, took quite different views from those expressed in the paper, so that Dr. Davies was led to say that at the next Convocation he would present the ablest paper of his life on this great geometrical problem, which purpose he failed to carry out because of his death which occurred soon after.

Even the definitions of geometry are often difficult to grasp, such as those of curves of different forms, parallel lines, a point, a line, a surface, etc., but no more difficult to the student prepared for their studies than the true conception of what he meets in his algebra, such as the minus quantity, nothing, infinity, indeterminate and imaginary quantities, quadratic surds, etc.; and I am sure that befor the scholar enters upon the proper work of geometry, he should avail himself of all the helps in reference to the nature of quantity and the methods of handling it which the algebra will give him.

Remarks of Principal Adelbert Gardenier.

Mr. Chancellor, Ladies and Gentlemen of the Convocation.— While I do not agree with the idea of teaching geometry before algebra, and while in my own practice I believe it is better to teach algebra first, yet if there are those in the State of New York who have tried it and found in their teaching that it is a success, I would feel like recommending to the regents that they do allow the substitution of geometry for algebra, as suggested by Mr. Smith. Each teacher has the right and privilege to use his own method, and while we may disagree as to the idea as to which should be taught first, yet in gaining the diploma they have all the subjects the same, therefore, I for one would be in favor of allowing the substitution suggested by Mr. Smith.

Remarks of Principal C. H. Verrill.

Mr. Chancellor, Ladies and Gentlemen of the Convocation.— I can see very great difficulties in the way of allowing any such substitution. This is not a new subject by any means. This discussion of the true order of studies and this idea of placing geometry before algebra is nothing new, and while I take a great deal of interest in the discussion for one, I have not a particle of faith in it. Our reasoning in mathematics is by analysis and it is by synthesis. Our work in mathematics from first to last is divided into two great parts, viz., the doing of things and the reason; the practical and the theoretical. We might say the *how* kind and the philosophical kind; and it is a simple matter what comes first. I have seen the time in the midst of my own teaching that I seriously thought that the theory should come first in all mathematical work;

I believe that the practical comes first. There is a wide difference between algebra and geometry, a very wide difference, and it is to my mind of considerable consequence what comes first; and my reason largely for placing algebra first is that it is not so philosophical, that it is more analytical. It is something that can be worked out without using the reasoning powers to that extent they must be used in geometry.

We all know, as teachers, that there comes a time in the minds of boys and girls when they can use their reason. I remember years ago when taking charge of a normal school, it occurred to me that if mental science was of so much use, why not put it in the lower class of the school, in what was termed the junior class, so that the students could grasp subjects supposed to have their foundations, so far as any theory is concerned, in mental science. I tried the experiment. I presume there are teachers on this floor who very quickly can tell what the result was. It was a failure. I could not do it. I could not teach it at that time. And my thought was brought to that very thing only a few days ago as I saw an article in the Pennsylvania School Journal, criticising the course of study in the normal schools of Pennsylvania, and he brought out that point very emphatically that mental science should go before any other subject in the line of professional work. I could not help thinking of my old experiment as I saw it. The proposition of my good friend from Stamford, that we recommend to the regents that they allow either algebra or geometry for the intermediate certificate is not a good one. It may sound good, but let us think what we are doing. Our school commissioners regard these intermediate certificates as reaching a certain line of work. They regard every one who has an intermediate certificate as well versed in algebra, through quadratics, ordinary algebra, and what will be the effect if they find that people are securing these certificates who have no knowledge of algebra whatever?

It may be suggested you hold that theory, and you know nothing about what the result of the other would be. I do know. My own experience is that it is not the best way, I know that there is a certain theory about it which seems right but put in practice it is not right. Pupils should be taught *to do* things first, and they should learn the more difficult things, those matters requiring more reasoning afterwards.

Remarks of Professor Oren Root.

Mr. Chancellor, Ladies and Gentlemen of the Convocation — I desire to differ with the gentleman who preceded me; and I must say I am heartily in accord with the thought of the paper. I am aware, I think I began to learn it many years ago, that there are things in mathematics we do not understand, there are points too fine for our seeing, and there are fields too wide for our grasp, but, Mr. Chancellor, they are in algebra and geometry alike. If it

were the question as to whether we should teach all algebra, and then all geometry, or all geometry first, and then all of algebra, that we might dismiss at once. We shall never teach all of either first or last. Nor can we probably entirely dissever the one from the other. Geometry, in its significance, means the manner in which quantity itself is considered, and algebra includes the processes by which quantity is dealt with. The one runs into the other. I do not believe that the human mind can conceive of quantity other than in form, and if it be conceived as existing in form, you have the geometrical notion. I do not believe that you can show me a process anywhere by which quantity is combined with quantity, and its balance of relations are considered, that you do not have the algebraic process. I know of no place where I can spread the threads and thus have mathematics with the woof on one side and warp on the other, and shall call one algebra and the other geometry. The point is this; granted that we must take these subjects one at a time; and the two subjects, the one in which the form is predominant over the process, and the other in which the process deals with the forms symbolized, and, therefore, abstract and attenuated. Which shall come first for the pupil? Shall you give the process dealing only with the abstraction represented by the letters of the English alphabet? Shall that be the first form? Shall you deal with the pure reasoning process first, or shall you do that which the mind of the child can grasp? I do not suppose any of the mathematicians have ever absolutely followed parallel lines. We argue about parallel lines and where they meet. They do meet, but where? That does not come here at this Convocation. When it does I suppose we can get precisely the definition as to what surface is, as to what a point is, as to what position is, yet a point, position without magnitude, mere nothingness is that in which there exists the directive energy that by and by shall develop the mathematical line and make it straight or curved. I do not suppose we would teach that in childish geometry, but there is a geometry that we can teach; we can make the child see the triangle, and can ask the child in what circumstances can you know that two triangles that I hold in my hands are equal triangles. How much must you know besides if I tell you that the three lines of one are equal to the three lines of the other? Would you have to put them together, or would you infer the equality? The teacher can show the child how, that if a triangle have a right angle, he can always know that the square of the longest side is equal to the sum of the squares of the other two sides. He can make them understand that. Supposing the sum of x and each y, the second degree is equal to r in the second degree, and express the truth in the algebraic form, and it is a deal harder for the child to understand than the other form. I believe that the late President Hill was right, that geometry should come before arithmetic. What we call arithemic is largely an algebraic process; yet we teach it geometrically all the way through.

The teacher who teaches square root, teaches his geometry first, and the teacher who has made cube root intelligible to his scholars in America, has been appealing to geometry before algebra. It is so all the way through. I do not believe that the world's pyramids can be bettered by putting them on their points, but if we find any world's pyramid standing upon its point, we can do better by putting it upon its base. I think it in my own mathematical teaching as I look out and study the boys who come to me from the academies prepared for the college; as I consider their preparations for college and their aptitude for mathematics, it is my conviction that it would be well if what we call elementary geometry should come in our course of study earlier than what is called elementary algebra.

XII.

COLLEGE ELECTIVES.

By President JAMES MCCOSH, College of New Jersey, Princeton.

The two grand college questions of the present day are, what place should religion have in the college, and what liberty should be allowed in the choice of electives. Both of these will engage the minds of thinking people for years to come. I have a very decided opinion on the first of these questions, in its bearing on what should be the highest end of all education, the elevation of the mind and the formation of character. In this paper I am to discuss the second of these questions.

At the opening I lay down the principle that a college, at least a university should, so far as the funds placed at its disposal admit, give instruction in every branch of high learning and science, taking care to exclude all that is spurious, or merely showy, all that is not established as true knowledge. This principle is adopted on the ground that all knowledge tends to educate and enlarge the mind, and may be made to promote useful, practical ends.

I.

Modern education may be regarded as starting in the seventh century when *scholae* were established in connection with cathedrals and monasteries. The branches taught were divided into a trivium and a quadrivium. The trivium embraced grammar, dialectics and rhetoric. The quadrivium consisted of geometry, arithmetic, music and astrology, that is, astronomy as then understood. These branches constituted the seven liberal arts. They were taught in a narrow spirit, but created a deep interest in the minds of young men, rich and poor. In the ninth century universities were established by Charlemagne and other enlightened monarchs, and these came to be divided into separate faculties such as those of theology, of arts, of law and of medicine, always under one head and government. I am now to confine my attention to the faculty of arts.

At that time there was no need of elective studies, no possibility of having them. In a four years' course a university could teach all that was then known of literature, science and philosophy. We moderns are apt to speak with contempt of the education of the scholastic ages. No true scholar will permit himself to do so. The studies with the attached disputations whetted the intellect, created a taste for learning and often excited great enthusiasm. In 1201 there were 3,000 scholars at Oxford, and in the time of Henry III

there are said to have been 30,000 there, "an exaggeration" says Hallam "which seems to imply that the real number was very great. A respectable contemporary asserts that there were full 10,000 at Bologna about the same time." Paris in 1453 contained 25,000 students. I maintain that a student who passed through Oxford or Paris at that time had a higher education than one in these days who chooses as his electives in the senior year a century of history, art, music and French plays.

A new era appears in the higher education in the fifteenth century. On the fall of Constantinople Greek scholars and Greek books were scattered all over Europe as seed, yielding rich fruits, and the Greek Testament and Greek literature and philosophy were introduced into the universities and were taught as humanities, an impulse to study being given by such men as Melancthon and Erasmus. In the seventeenth century the subjects of study were greatly widened by the introduction of the new mathematics by Descartes, Newton and Leibnitz. During all this century a very solid education was imparted, especially in logic, in philosophy and in law; and a number of the great men of the world had their characters formed by it. All this time there were no electives in our colleges, and young men did not betake themselves to specialties till after they had received a comprehensive training in universal learning as then available.

But there is a great change in the eighteenth century when Newton's great discovery was made known and the Royal Society of London and the Academy of Science in Berlin, and the French Academy were instituted, and chemistry and botany and zoölogy were cultivated. After a struggle these were admitted into the curriculum of our colleges and added immensely to the bulk of the body of knowledge and a difficulty was felt in requiring every student to eat and digest the whole.

It is in this century and especially in the last age that the need of electives was felt, and is pressing every year more heavily upon us. The physical sciences have multiplied immensely, so that it is now difficult to name or number them. They now run over the whole of nature and penetrate into the most minute departments. There are men who devote their whole lives to the study of some one branch which the great body of mankind reckon a very insignificant one. In former ages it was thought that the earth was created six thousand years ago, now it is shown that it has had an existence for millions of years, and savans are eagerly bent on unearthing the rocks and fossils which disclose its history during that long period. It was thought in ages past that the heavens were of a higher nature than the earth, now it is proved that they are composed of the same elementary bodies and there is a conservation of energy throughout them all. While the telescope is showing the infinitely great and distant the microscope is disclosing equal wonders in the small and the near.

Fortunately, providentially as I think, while there has been in this way an advance as great and wonderful in other branches of learning, philology is now an important science, and it has numerous or rather innumerable subdivisions. We know more of the classical tongues than the Greeks or Romans. The origin and history of our own tongue has been carefully investigated. There is a careful study of the Shemitic tongues, and the beginning of a scientific investigation of the languages found by missionaries in the rudest countries. History now takes in countries, the very existence of which was unknown to our fathers. The aesthetic principles involved can be investigated now that we have before us the literature and art of all countries rude and cultivated. Archæology now comes in to combine history, art and literature. We have the means of knowing the reflective thought, that is the philosophy of not merely one individual and one country, but of all people, and can lay hold of the truth and avoid the errors which these systems contain.

II.

It is impossible, in these circumstances for any student to master all the branches of real knowledge. The age of universal scholars, such as the world had in Aristotle, Scaliger and Leibnitz in former ages, is past and can never return. I remember that when I became a professor in the Queen's University in Ireland, then newly established, thirty-four years ago, an attempt was made to embrace all knowledge, ancient and modern, scientific and literary, in our curriculum and to impose it upon the brains of the students. The attempt utterly failed. Some of the professors in the Queen's College turned nearly every student as no one could master any one branch of learning when they had so many forced upon them. Other professors allowed nearly all to pass, as they saw that no brain could possibly contain the whole. So we had to abandon the plan of universal knowledge and to adopt an elective system, which was found to work advantageously.

It is a curious circumstance that the elective system has, as yet, very little place in the older and larger universities of Europe which, as a general rule, have one prescribed course for the whole students for their whole four years' course. The secret cause of this opposition to elective courses in the higher universities of Europe is to be found in the circumstance that the professors get a portion of their incomes from the fees of the students whom they have individually under them, and the division of these branches of study and the institution of a new department drawing away their students would lessen their income. In this country the professors are paid out of the general funds of the college, and they have no pecuniary motive to lead them to oppose the introduction of electives which are now found in one form or other in all our higher colleges and are excluded only in those institutions which have not sufficient funds to enable them to provide the requisite

teachers. The consequence is that the American universities are, in this respect, in a better position than most of the European ones for admitting new branches of learning, and for widening indefinitely the curriculum of study, and they should eagerly embrace their opportunities and not make themselves dependent on foreign universities, where they may get evil with the good. America should now aim at nothing less than having every branch of true learning taught in its universities. I believe it might accomplish this high end in a very few years from this date in several of our universities. I wish I were ten years younger and I would attempt it at Princeton But the probability, the possibility of all this depends on the way in which electives are regulated and conducted in this country. If they are conducted in an injudicious manner; if young men in the freshmen class and upward are allowed an unrestrained and unguided choice, to choose, if they are lazy, the easiest subjects, and the lower subjects requiring little or no thought or application, then nothing but evil will follow, and the old universities of Europe will continue to realize a higher standard of scholarship than we do. The mode of regulating these electives is the subject I am to consider in the remainder of this paper.

III.

Electives are now a necessity in all the higher American colleges. The all important question is how are they to be regulated. Are we to allow students in every class, from the freshmen upward, to choose what they please or are we to impose some restrictions? and if so, what? This, next to the religious question, is the most important college question in these times.

In entering on this discussion I wish it to be understood that I am to refer mainly to what should be required of those who are seeking the A. B. and, its consequent, the A. M. degree. These degrees are given in all the colleges of the English speaking nations. In too many cases they have been given without the proper qualifications being required. But the degrees have a meaning, they imply a certain amount of general scholarship and culture. They have a prestige which should be carefully preserved by the colleges. The expectation of receiving the degree at the close of a certain course of study has been a powerful incentive to diligence. We must carefully watch in order to see that this incentive to learning be not lost, and, further, that the requirement for obtaining it be not lowered. If this is not done, the reputation of the country in scholarship, which is not so high as that of some other countries, will be diminished; and we would be esteemed a practical and not a learned or scientific people; and our very power of practical invention would be lessened, as success in work depends so much on a previous scientific investigation, as seen, for instance, in the steam engine, in the telegraph and the telephone, all of which were the outcome of deep scientific research. A

merely practical people will never be so thoroughly practical a people as those who have also studied the sciences on which practical inventions depend. I would lay down a few positions fitted to carry out this view.

1. *There should be prescribed studies in every year of the college course.* — The college authorities should lay out an arranged curriculum every year, beginning with the simpler and going on to the higher. There should be a freshman year course, a sophomore year course, a junior course, and a senior course. Different colleges might draw out somewhat different courses, still there would be a general agreement, as there has hitherto been, in our American colleges. In these obligatory courses there should be embraced what have been determined by experience and our best educationists as fundamental and disciplinary branches, fitted to train the mind on the one hand, and to yield practical fruit on the other. Boards of trustees and faculties, if they are at all fit for their work, should be able to fix on these obligatory studies. Without enumerating all these, we may notice some of them, giving a sentence or two to each.

Language is a natural endowment. It appears very early. It should be cultivated with care. It should have a place both in school and college. Our own tongue should have the first and the last place, partly because it is our own tongue, but mainly because of its high excellence as an aggregate of various languages, and because of its rich and varied literature. I do not agree with those who would have science only taught to boys and no literature. Let us have both, to suit the diverse faculties with which we are endowed. Let us not set facts and words against other. Words are facts, and have had a mighty influence; by them we get by far the greater part of our knowledge. By language the thoughts of our ancestors and of the wise and good in all ages has been handed down to us. A boy can learn a language before he can master a science. Every educated man should know a few languages in addition to his own, in order that he may know how other people look at things, what distinctions they have drawn, and under what heads they have arranged things.

I have defended the study of language not because it is higher than science or philosophy, but because it has been assailed. Under this head the controversy turns round Greek, but will soon turn round Latin also. I have a very strong opinion that Greek, including language, literature and philosophy, should be placed among the studies required by those who are seeking for the degree which proclaims that those who possess it are educated men and women.

Greek is the most perfect tongue and contains the highest literature of the old world. A literature superior to all others in ancient times and equaled only by the English and German in the modern world. Without the knowledge of the Greek and Latin the ancient world would remain a very much *terra incognita*. By these two tongues the treasures of antiquity have been handed

down to us, and these, to say the least of it, are as valuable as the knowledge of fossil plants and animals in distant worlds or distant stars. God has given us faculties not only of observation and of judgment, but of taste and imagination, and these are to be cultivated by the highest models of art and literature in ancient and modern times. I hold that in a four years' course at school and in a four years' course at college, there is time for the study of Greek and Latin as well as French and German.

I have made this defense not because I place literature above science, which certainly I do not. In a four years' course at college there is room for both, and both are needful to the full development of the mind and to secure practical ends. I certainly hold that certain branches of science should be acquired by all who are entitled to be regarded as educated gentlemen.

I would not call that man a scholar who has not studied mathematics. It is not necessary that every student should know the higher mathematics, such as quaternions, quantics, but he should know the method. It begins with truths perceived at once, and thus shows us that we cannot prove every thing, and that there are positions which we are entitled to assume when tried by the tests of self-evidence and necessity. It gives us the most consecutive specimens of reasoning. It is a necessary instrument in many of the sciences. In the education of the mind, it gives more than any other branch of knowledge, concentration and consecutiveness, and thus saves youth from that intellectual dissipation which is the ruin of many.

Equally important with either literature or deductive science are the inductive sciences. I need not defend them, their value is acknowledged by all. In the common affairs of life we cannot have demonstration, we have at best only probable evidence. The mind must be trained to get truth, scientific and practical, from such evidence. It is thus and thus only that we come to know the wondrous works of God in heaven and earth, and learn to apply general laws to practical ends.

But accompanying all these, and so far combining and grading them, there should in every college be another department. The trinity in college education should be literature, science and philosophy. Man's reflective powers should be cultivated as well as his aesthetic and observing ones. That man is not a scholar who does not know mind as well as matter; mind with its wondrous laws and operations; who does not know himself as well as other things. Among required studies I would place psychology, logic and ethics. If these are left out, we will rear a body of materialists believing only what is seen and temporal, and not in what is unseen and eternal. Under the same general head of philosophy, as exercising the reflective powers, might be placed the various social sciences, such as political economy and jurisprudence, so important in a country where the people govern themselves, and should be led by

educated men. Universal history cannot be taught in a college, nor can the various departments of art, such as painting, sculpture and architecture, but the science or fundamental principles involved in these branches should be taught in every college and expanded in every university.

IV.

With a well arranged plan of obligatory studies, there should be combined an indefinite number of elective studies. Let there be first the trunk to bear up the whole; but let there also be branches, leaves and flowers to give a full form and ornament to the organism. Every new branch of learning may be in the curriculum, but on the condition that it be true learning. The business of a college here is to arrange the electives properly.

I am disposed to argue that no electives should be permitted in the freshman year. In this year the student should be carefully instructed in elementary branches, and become acquainted with the general system of the college, and thus be prepared to make a deliberate choice in future years. It is a mistake to commit a student too early to a special line before he or his friends who advise him know what he is fit for. He may then be tempted to make a decision which he regrets all his life after. It may be doubted whether there should be electives, or at least many electives, allowed in the sophomore year. The first two years of a student's course might be used to finish the elementary branches; lay a foundation sure and solid.

In the junior, but especially in the senior year, electives may be freely allowed, care being taken that too many of them be not required in any one year or of any one student. I should say three, and certainly not more than four in each of the years. Every institution calling itself a university ought to have a great number and variety of branches thrown open to students to gratify their tastes, to fit them for their professions, and to lead young men to throw themselves into the work of advancing the new sciences.

But it may be said why not allow an unlimited choice to every student? Tastes and talents, they say, differ, and why not allow every one of them to be gratified? The answer is that while there is such a variety in human nature there is also a sameness, and the identity should be provided for as well as the diversity. There are subjects, such as those I have named, having the sanction of a universal experience, which, from their own nature or their relation to other studies, ought to be known to every educated man. Then it is by no means certain that young men are always fitted to make a judicious choice, those who regard themselves as the best fitted may be the most unfitted. In Harvard there is almost an unlimited choice, the student requiring to take any four subjects he prefers in each of his four years, only one small subject being required in the freshman year. With this small exception it is quite practical for a student to pass through Harvard and receive the degree

of B. A. without taking any course in Latin, Greek, mathematics, chemistry, physics, astronomy, geology, logic, psychology, ethics, political economy, German, or even English.

It has been shown that under this system many make admirable choice and become superior scholars. But it has also been shown that a large number do not make a high choice, but select the topics which require little rigid thought, such as a century or two of history, music and art.

The positions I have laid down apply only to those who are seeking the degree of A. B., with its complement A. M. This degree I am anxious to keep up to its present standard. But I am of opinion that the time has now come when other degrees might, nay, I think should, be added to those commonly conferred. There should certainly be degrees given in science, such as B. S., M. S., D. S. There might be corresponding degrees in literature, B. L., M. L. and D. L. In this department there should be philology, including languages, ancient as well as modern. I am so liberal in this matter that I have no objection to degrees being conferred on music and in the fine arts. It must be secured, however that condition be implied on the part of the applicants, and that every degree have a meaning designated by the title, so that no one can misunderstand it, or suppose that one who has the degree of doctor of music is sanctioned as a scholar.

V.

Before closing I may be permitted to refer to a closely connected subject. At what age should students enter college? In the former days they entered early; Francis Bacon at thirteen and David Hume at twelve. This premature entrance continued down to the middle of this century. In the present age there has been an attempt to change all this, and the doctrine of advanced educationists now is, that no one should enter college till he is eighteen, or more. I observe that a few thinking men are beginning to inquire whether this is not running to the opposite extreme.

It is well known that the number of students in our colleges is not increasing as the population does. Now whatever other causes may operate, the main cause is to be found in the late period at which young men finish their education. Let us realize the case as it presents itself to a father and to a thoughtful young man. He enters college at eighteen or nineteen, and graduates at twenty-two or twenty-three. He then begins to prepare for his profession which occupies two or three years more. He is twenty-five or twenty-six before he can earn a cent of money. Most parents feel that they cannot sustain their son so long, or they fear that they may die before his education is completed. Most young men, especially those who have to earn the means of educating themselves, feel that they cannot spend so many long years in what is mere preparatory work. This is the most influential cause of the relative decrease in the number of students.

I believe a reaction is at hand. Why should not teachers begin to give easy lessons in Latin to boys at nine, all the while devoting the chief attention to the common school branches? Why should not teachers strive to have their boys ready to enter at sixteen, or soon after? Parents might tell teachers that they expect this. I am sure that when boys are healthy and have fair talents that can be done. About this age boys are apt to get tired of the drill of the lower schools and need a change, need new motives called forth and greater freedom. Students would then graduate at twenty or twenty-one, and enter upon their professional work at twenty-four, when their faculties will be in their most active state, when they will be eager for employment. At this age many, I would say most of our eminent numberless lawyers and statesmen have started on their professional career. But it is asked: Are there not schools and academies at which the student should continue longer than the age of sixteen or seventeen? I answer at once that I believe there are. I wish there were more of such schools. By all means let the boy remain there a year longer and enter sophomore; and in the year following they are juniors when the reflective faculties are called forth and new worlds opened to them.

But it is argued that boys entering at sixteen cannot have all knowledge. I admit it. In our now crowded under-graduate course, no one can become a ripe scholar whether he enters at sixteen or eighteen. But at the age of twenty, students at a well-regulated college may have a large amount of knowledge to enable them to enter profitably on their professional careers. In no country in the world, certainly not in Oxford or Cambridge, not in Edinburgh or Berlin, as I can testify, are all the students great scholars. But in every living college there will certainly be one in ten, not infrequently one in every five, who in their under-graduate course will acquire a taste for more than they have got, and this should be met and gratified by post-graduate studies.

Every good college is now striving to be a university. It is a laudable ambition, only no institution should call itself a university till it is so. Let it be called a school as long as it is a school, a college as long as it is a college, and a university only when it teaches all the great branches of learning to those who wish it, and in particular has a number and variety of post-graduate courses for those who, after taking their first degree, wish to specialize and to perfect themselves in particular branches. Let our bright students be encouraged and allured by a thirst for knowledge which they have acquired by higher degrees, by prizes and fellowships, to go on to these higher courses. By this means, and I believe by no other means, can we secure on the one hand that the students will increase with the population, and the universities will be able to rear a body of ripe scholars in the various departments of learning, and thus rank along with the great universities of Europe.

XIII.

THE MUTUAL RELATIONS OF THE COLLEGES AND ACADEMIES.

By Prof. W. T. Hewitt, Cornell University.

New York possesses in the University of the State an organized institution which by skillful administration may exert an effective influence on all secondary schools; by it they may be brought into such relations to higher learning as will give vigor, directness and unity to all subordinate instruction. The public schools and the colleges should not be parts of independent and divergent systems. The higher should condition the lower; influence from above should work downward through all the schools of the State, and advanced education should not be held in trammels by ineffective methods of teaching or organization in the subordinate schools.

The Board of Regents constitutes a central authority by which the public schools are brought under direct supervision, such as does not exist in any other State. Different methods shape instruction in New England and the west, the character of which we shall discuss later. We assume that the aim of any educational system should reveal unity of purpose extending to all schools; the demands of the higher institutions should find their supplement in the lower, and the lower should afford the basis of all that is later developed in advanced instruction. The regents' examinations exert an influence extending to all our high schools and academies, an influence prevailingly beneficial to elevate and shape the character of the instruction in those schools. It remains to inquire whether everything is attained that is possible, and whether equal results are not achieved in other States without this system; whether there are not modifications and enlargements which may perfect a system already meritorious, but capable of higher results.

This official supervision proceeding from a central bureau is exerted mainly by examinations. Papers equal in character are sent to the principals of the high schools and academies, and the division of a certain fund is based upon the number of scholars who pass successfully a set examination.

The efforts of teachers are largely directed to prepare the greatest number of pupils for this examination. An element of possible danger has already been recognized in this theory; unless the papers issued by the secretary of the Board of Regents are scientific in their character, covering broadly the subject which is taught, teachers will fall into formalism and

literalness in instruction, aiming not so much to impart a mastery of a given subject, as a technical training based upon questions which are expected, and which the experience of years may enable them to anticipate. This will be the case unless there is great freshness and originality in the papers which should embody the views of the most skillful educators, and develop every subject from the standpoint of the most scientific instruction. The central defect of this system is its lack of personality; formal papers, however excellent, based upon no distinctive text book and possibly apart from the general instruction, can give but an unsatisfying result; much and possibly essential features of the year's instruction will not be included; and pupils will strive with anxiety and uncertainty toward an indefinite goal. Only the utmost skill and wisdom can prevent these results in a large number of cases. My observation and my inquiries confirm this impression, and I think the above statement not unfairly characterizes the attitude of pupils who approach these examinations. The German government requires the course in *prima*, the last two years of the gymnasium to be taken entire by all students, "that the instruction in this highest class may not degenerate into a preparation for the examination, that the pupil may have the requisite time to come steadily and without overhurrying to the fullness of the measure of his powers and character, that he may be securely and thoroughly formed, instead of being bewildered and oppressed by a mass of information hastily heaped together." The great Wolf was accustomed to say, *perverse studet qui examinibus studet*, "He applies himself wrongly who applies himself for the sake of examinations." An official inspection of the instruction and work of every teacher and school by a competent educator would exert an additional impulse and guide which the mere formal character of the examination papers cannot effect. With this method I would compare the system which has sprung up through-out the high schools of Michigan. The University of Michigan forms the crown of the public school system of the State. It is supported by a State tax and governed by regents elected by popular vote. Tuition is free to all students in the State; it is practically what the German universities are sometimes called, and the name that the Dutch universities still bear, the "high school" of the State. Instead of retaining the exclusive right to test the scholarship of candidates for admission as formerly, candidates are admitted without examination from schools whose curriculum of study has been approved by a committee of the faculty of the university. This committee, or some members of it, visits any high school or academy whose governing board or principal requests it. If the committee after inspecting the methods and character of the instruction and the results of the examinations is satisfied with the work, graduates are admitted to the university without examination, upon presenting the diploma of the school.

If, by experience, it should be found that the diploma is issued to unworthy students, the university withdraws from that school the right of the free admission of its graduates.

In some cases high schools in large cities have been debarred from this honor for years, until their instruction has been improved. The result has been that high schools covet this privilege, and vie with each other in the thoroughness with which their students are fitted for the university, and a uniform, high standard of scholarship in the elementary schools is maintained I ascribe this result to the unifying of the requirements throughout the secondary schools, and to personal inspection by competent scholars of the work which is done in every school. President Angell in successive reports has stated that the university has suffered no loss from allowing the power of examination to pass to the high schools, but that the verdict of experience has shown that graduates admitted by diploma from approved schools have maintained a standing which justifies a continuation of the system. Cornell University has a similar standing committee which examines the courses of study in the high schools and academies which apply for the free admission of their pupils. Those who are familiar with the final examinations in the gymnasia of Germany will recognize that there is an approach here to conceding to our high schools the rights and privileges of the graduates of the gymnasia. The *Abiturientenprüfungen* admit to the university without further examination. The state regulation of instruction in the subordinate schools prescribing the number of hours which shall be devoted to the Latin, Greek, mathematics, history, the modern languages and religious instruction, makes a compact system possible, which cannot be applied in this country in the same way, according to the present law. The exertion of the influence of a central authority must be indirect, still permitting a large liberty to the school boards. To one who is familiar with the high standing of certain schools in New England, such as the Phillips Academies in Exeter, N. H., and Andover, Mass., the Boston Latin School and others, it is a matter of surprise that there are not more schools in New York, with its great population, of equal reputation. Harvard University has affected the character of the instruction in all the secondary schools of New England. President Eliot testifies that every advance in the requirements for admission to Harvard, has been met by a corresponding advance in the instruction in the secondary schools. Harvard by its reputation and character, has thus accomplished indirectly what the University of Michigan has accomplished by direct effort.

There is a portion of President Eliot's last report, which may have a profound signification if the future shall confirm what seems to be a present tendency. Within the last twenty years there has been a gradual decline in the number of students admitted to Harvard University from the public schools, and an increasing percentage of students who come from endowed or private schools. In

1866, the number who entered Harvard from the public schools was thirty-one per cent. of the entire number; ten years later, in 1876, it had fallen to twenty-two and six-tenths per cent.; in 1885 it had increased to twenty-eight per cent.

If we divide the period from 1866 to 1885 into five parts, as President Eliot has done in his report, the proportion is as follows:

From 1866–69 the number was thirty per cent.
From 1870–73 the number was thirty-three per cent.
From 1874–77 the number was twenty nine per cent.
From 1878–81 the number was thirty-one per cent.
From 1882–85 the number was twenty-six per cent.

There is, however, a possible explanation of this phenomenon in the fact that a far larger number of the students of Harvard was drawn, twenty years ago, from established schools of the State of Massachusetts, while of recent years the number of admissions from other States has greatly increased. In 1865 the number of students from Massachusetts was seventy-one per cent, while in 1880 it was sixty-one and five tenths per cent; in 1865 the proportion of students from New England was eighty-one per cent, while now it is only sixty-nine and five one hundredths per cent. If it should be shown that our public schools are becoming divorced from their normal position as seminaries for our colleges, it would indicate a divergence from their proper mission or an incapacity to keep pace with the demands of higher learning. An encouraging fact, however, which re-establishes our confidence in the scope of high school instruction, is shown by the statement that there is an increasing number of high schools that prepare students for our best colleges. In the period from 1867–74, fifty-two public schools prepared students for Harvard College; from 1871–80 the number had risen to seventy-eight, and from 1876–85 the number had reached eighty-one, or an increase of fifty-six per cent. in about twenty years.

If we test the results of the instruction in our high schools and academies by the evidence revealed in the examinations for admission to our various colleges, we shall find that there is much to be desired in the arrangement of studies and the quality of the instruction. I quote from the report of President Eliot of Harvard, where the facts regarding the attainments of students upon admission have been investigated with an accuracy and value surpassing any others with which I am acquainted. In prescribed subjects in 1885, six per cent. failed in Cæsar and Virgil; eight per cent. in Latin composition; six per cent. in Xenophon or the Greek reader; eleven per cent. in Greek sentences and nine per cent. in ancient history and geography; while twenty-seven per cent. failed in algebra; six per cent. in arithmetic; twenty-three per cent. in plane geometry; twenty-one per cent. in physics; fourteen per

cent. in French or German, and fifteen per cent. in English composition.

In elective subjects: Twenty-seven per cent. failed in trigonometry; twenty-two per cent. in solid geometry; fifty per cent. in physics and thirteen per cent. in chemistry or botany. These failures were in English examinations.

The average percentage of failures in required studies from 1879 to 1884 was as follows: In Cæsar and Virgil, nine per cent.; in Latin, at sight and composition, six and six-tenths per cent.; in Xenophon or the Greek reader, twelve; in Greek sentences, sixteen; in ancient history and geography, thirteen; in arithmetic, twelve; in algebra, twenty-seven; in plane geometry, twenty-five and five tenths; in physics, fourteen; in English composition, sixteen; in French or German, seventeen and three tenths.

These figures are significant; they indicate that a larger number failed in algebra and plane geometry than in the required Latin and Greek.

If we turn to the more advanced elective studies offered for admission, we find some striking statistics. The average number of failures from 1879–84 was, in Cicero, Virgil and Ovid, about thirteen; in Latin, at sight and composition, twenty-two; in Herodotus, thirteen; Greek composition, twenty-three; Iliad, ten and five tenths; in trigonometry, thirty-six; in solid geometry, thirty-five; in physics, twenty-nine and five tenths; in chemistry or botany, sixteen and five-tenths per cent.

If we compare the initial with the final year of this series, 1879 with 1884, we find a manifest advance, which indicates the gradual improvement of the preparatory schools in their preparation for college. These numbers may be taken as fairly representing the character of the preparation of students in one of our leading colleges. The records of the mathematical faculty of Cornell University establish the same general fact, and a careful study of the statistics of other institutions would undoubtedly confirm this result. They show that the increased demands which were made upon the preparatory schools have been met, and how successful a systematic effort to elevate the examinations and the standard of instruction in the public schools of New England has proved. They show further that the defects in preparation are greater in English studies and in mathematics than in Latin and Greek. A large part of these studies are pursued previous to the study of the classics, and hence the deficiencies in preparation are directly due to our public schools. These subjects are few in number, but they are the essential subjects, whether required as preliminary to a classical or a scientific course in college. If these leading English studies are not taught successfully in our public schools, it becomes a grave question how the time of the pupil has been occupied. In place of disciplinary studies a variety of light and disconnected branches pur-

sued for a brief period dissipates the attention and weakens the powers of the pupil. Compare what is accomplished in a German gymnasium in the same period of time in which pupils are in our public schools. There the course of study covers nine years; at the expiration of this time the student graduates a thoroughly trained linguist in Latin and Greek, familiar with the best authors and able to quote from them; he is also well versed in the history and literature of his own language and in the master-pieces of English and French literature; often well grounded in Hebrew; and with an excellent training in mathematics, ancient and modern history, the elements of science and philosophy. He enters the university with a diciplined mind, fitted for general and professional studies. Does the American boy of the same age, with his scanty algebra and geometry and history, ignorant often of French or German or any sound knowledge of Latin or Greek, possess any equivalent for this, either in knowledge or in mental discipline? Seriously, what are the results of the ten years of study, between the ages of eight and eighteen, in our public schools? These are the years of promise, when all the powers are unfolding, when memory and imagination are active and the young mind aspires after real acquisition. Mathematics is frequently studied throughout the entire public school course and never really completed. By mathematics is meant arithmetic, possibly algebra, and occasionally parts of geometry and trigonometry. Can not a skillful teacher, in three years, by systematic instruction, impart a thorough knowledge of these branches if pupils are of sufficient maturity when these studies are begun? Why should pupils linger over intricate problems in arithmetic, depending for the proper solution upon a knowledge of geometry, when the essential principles of arithmetic, all the man will have occasion to use, can be so easily acquired? The attempt has been made to teach grammar without referring to the historical facts which are necessary to explain many of the most familiar principles. Has not the time of our public schools been consumed in teaching these two subjects, and yet, on entering college the student is often deficient in an accurate knowledge of English, the familiar principles of language and of mathematics.

I cannot refrain from mentioning an evil which pervades all our schools, and which is of so universal a character that it affects all public school instruction, and contributes to imperfect preparation for college. This is the extensive use of popular but unscientific text-books. There is a great waste of valuable effort in the study of a book confused in definitions and neither orderly nor progressive in arrangement. Akin to this evil is that of using books too advanced in scope and too extended in details. Many a youth has spent a half-dozen winters on some bulky arithmetic or absurd English grammar. Until within a few years no grammars have had a historical basis. They have attempted to codify the multitudinous

uses of common speech by a comparison with one another, or with Latin. To most scholars all verbs were "regular" or "irregular," until within a short time. "Strong" and "weak," as applied to declensions or conjugations, were unknown terms. An accurate explanation of the formation of tenses by additions to a verbal root or in connection with auxiliaries, is still foreign to the majority of grammars that are sold. The text-books should not aim to be "manuals" or exhaustive, but to present succinctly and clearly the essential principles of the subject. Elementary Latin grammars may possess a scientific statement of principles which will not require change in advanced study. A lack of consistent order in study is mentally confusing and discouraging to the pupil. One scholar who had completed her academic course, said to me that she had been through three Latin grammars. She did not, however, know one Latin author. Her whole course in the classics had begun and ended with the most barren facts of language. This pupil had been sacrificed to capricious views and to an unnatural method, and this murder of the innocents is re-enacted again and again in the school-life of every pupil. The essential facts of language are the same whether studied in English, German or Latin. One statement would express many of the principles common in these languages. Hence the imperative necessity to exercise the utmost wisdom in the selection of elementary text-books. It is a favorable sign that eminent scholars are devoting their attention to the preparation of such works. A good volume wisely chosen can accompany the pupil as a book of reference in all subsequent study. The same definitions and statement of principles will be fixed in the mind, and that mental uncertainty which is so fatal to progress and sound scholarship will not arise. In the Prussian schools text-books are chosen by the masters with the greatest care; they must then be approved by the provincial board, and at their introduction be sanctioned by the minister of education and his council. The words of Matthew Arnold upon this subject in England, are extremely forcible: "Many as are the absurdities of our state of school anarchy, perhaps none of them is more crying than the book pest, which prevails under it. Every school chooses at its own discretion; many schools make a trade of book-dealing, and therefore it is for their interest to have books which are not used elsewhere. * * * The extravagance of this is bad enough, but then, besides, as there exists no intelligent control or selection of them, half at least of our school books are rubbish, and to the other defects of our school system we may add this, that in no other secondary schools in Europe do the pupils spend so much of their time in learning such utter nonsense as they do in ours."

If pupils who are preparing directly for college are thus deficient in the few required subjects, is there not *a priori*, a strong reason for believing that students whose attention has been scat-

tered over a multiplicity of minor subjects, have failed to receive adequate culture from these varied branches of knowledge. I recognize the province of the high school as two-fold, viz.: To instruct the few who are preparing for higher studies elsewhere, and to give a symmetrical training in the essentials of a good education to those whose studies will end with the high school or academy. What may properly be included in a course of study extending through eight or ten years? Few students who enter college devote more than three years to preparation in the classics. If mathematics can be mastered in three or four years, ample opportunity exists for the study of English, and for French and German. It is a mistake to let the years pass, when the child is especially gifted with a verbal memory, without beginning the living languages, as well as the classical tongues. Subsequent study will never replace the freshness of impression which is possible in the earlier years.

The modern languages are not only instruments of culture but of practical value in a country so cosmopolitan in its citizenship as our own. The French and German languages contain not only treasures of modern scholarship and learning, but also rich literatures, a knowledge of which is essential to every educated person.

How can the public schools fulfill their duties to higher learning unless the courses of study are simplified, and every subject is taught by a skillful and conscientious teacher, so that pupils pass with trained intellects and accurate knowledge to higher studies or the graver reponsibilities of life. The German proverb is true, in all knowledge, that nothing is so prolific as a little known well. The mastery of a few things gives a consciousness of strength, and makes a subsequent acquisition far easier.

If the public schools owe to the college the skillful and scientific training of their pupils, what do the colleges owe in return to the public schools? It may be that the defects in elementary instruction are due to the divorce which has existed between the colleges and the high schools. The colleges have been independent corporations, governed by boards which did not recognize their duties to the general school system of the State, and possibly they have failed to sympathize with other educational institutions. The public schools must minister to the demands of the colleges in their enlarged courses of study, or private and endowed schools will see their advantage and claim the province of giving the best training to candidates for colleges.

I regard the lack of sufficient inducements to retain in the profession of teaching those best qualified for their work, as one of the gravest defects in our school system. In Germany the government recognizes and promotes all skillful and accomplished teachers. Many an obscure teacher in a gymnasium wins eminence by his publications. There is an army of silent scholars and workers who are pushing forward the boundaries of knowlege. One defect

in all college training has been that scholars have not been taught to investigate. Original study and research in some departments of knowledge is within the sphere of every scholar and teacher. Some silent scholar in his walks may contribute a knowledge of the flora of a remote district to the science of the world. No department of study is locked; all nature stands with open doors, revealing wonderful vistas to the thoughtful student. Let no teacher scorn to limit the range of study to any undiscovered truth, and the world will be made richer *for* his work.

I would recapitulate the points which I have traversed in the present paper. The examinations held in our colleges indicate defects in our public school system; these defects are found in familiar subjects and not merely in the more difficult as in the classical tongues; a system of impersonal examination has certain dangers unless conducted in a broad scientific spirit and elevated above a mere formal and technical character; the whole school system of Michigan, and in part of Wisconsin and Indiana finds its crown in a State university, the requirements to enter which give direction to the high schools of the State; systematic inspection of schools by thoroughly competent visitors from the office of the Department of Education at Albany would promote a common standard in our high schools and academies; the high schools must meet the just demands of the colleges or their work will devolve upon private and endowed schools; there is time enough in the ordinary course of study in our public schools for the successful study of the classics, modern languages, mathematics, historical English and American history; the evils of our present system are due to a dissipation of attention through a multiplicity of studies; by concentrating the attention of pupils on a few leading subjects, discipline and the mastery of certain great provinces of knowledge are promoted.

I have now to ask whether the colleges by united action can raise the standard of instruction in our public schools. I believe they can, and that their first aim should be to avoid usurping the functions of the public school. If colleges impart in their first two years, instruction, not superior in degree to that given in our public schools, we have two agencies to perform the same work. The common schools are at a disadvantage; they are robbed of what is their distinctive field. If colleges find their mission in teaching subjects elementary in character, and which can be taught in accordance with the development of the human mind better at an earlier period, the high schools have little reason for one portion of their work. The honor of the school system is promoted by recognizing that elementary study and certain branches of study naturally belong to our public schools.

A conference of college presidents and representatives of the faculties might be held under the auspices of the Board of Regents to agree upon certain requirements for admission. Let the colleges

give up the work of the preparatory schools, some part of which they have been called upon to do from the defects of our public schools, and as in New England, we shall see an advance in the quality and in the standard of instruction in our high schools; their work will expand as we demand a higher work from them. Teachers will prepare themselves to do this advanced work, and schools will win prominence for the excellence of their preliminary work. Etons and Rugbys will be found in our academies.

Principals of our high schools are discouraged when they see their best pupils slip away when their course of study is incomplete and find easy admission to latitudinarian colleges. When the value of vital culture pervades the people our school system will be pervaded by a living energy; and the education of the immortal intellect will seem worthy of the highest endeavor. When the system of our civil service shall be perfected so that the people demand special fitness in their public servants, we shall see public employment an honorable ambition, and education, both primary and advanced, recognizing a new province of work in preparing students for the public service.

I regretted greatly when the intercollegiate literary and scholastic contests were given up. There was a healthy vitality in these competitions, and I rejoiced when honors were borne away by the students of remote colleges, whose work had been hitherto little known. The work of a thorough and able teacher in some one department becomes known, and colleges and students feel an incentive to a higher endeavor. A series of under-graduate and fellowship examinations should be held yearly, under the auspices of the Regents of the University, and valuable rewards should attach to excellence in different branches. In the former intercollegiate contests the examiners were, with hardly an exception, scholars of eminence. The papers in Latin and Greek and mathematics were drawn up by scholars whose judgment was accepted as of the highest value; the literary prizes were awarded by men of distinction in letters, as George William Curtis, Thomas Wentworth Higginson and Richard Grant White. It would not be well to limit the judges to scholars of New York, but eminent authorities in special branches from outside the State should be invited, and should be paid to act as umpires in the award. The prizes should be confined to actual students of colleges in this State. I believe an honorable rivalry would then arise in all departments of learning. Such examinations might cover honors in Latin, Greek, comparative philology and Sanscrit, mathematics, French, German, Anglo-Saxon and Historical English, physics, chemistry, special branches of natural history, political economy and history. The fellowship prizes to graduate students should be sufficiently large that those who received them would be enabled to pursue advanced studies either in this country or abroad. Merit would be encouraged, and in a few years we should have scholars

trained in the best learning of Europe, bringing back their treasures to enrich our own country. Such scholars would build up our school system, add to the scholarship of our universities and become investigators who would add to the reputation of the State. The award of fellowships should be based upon examinations, and equally upon meritorious investigations, showing the capacity of the students to pursue advantageously special subjects of study. In addition to the individual encouragement would be the general benefit to all the thirty-six colleges of the State, which would become centres of a vigorous, intellectual activity, and parts of a common system.

The colleges of the State would realize a part of Hamilton's prophetic vision of separate institutions, forming part of one great university, and the University of the State of New York would exert a far reaching influence worthy of its great name and transcendent possibilities.

The school system of Prussia, which is worthy of the study of every student of education, owes more to Wilhelm von Humboldt than to any other man. In the year and a half in which he was minister of education, the whole school organization of the country was transformed. A central power exerting its authority alike over the universities, the gymnasia and the public schools, asking and demanding provincial and local co-operation, exact in its requirements, and yet allowing liberty within the domain of law, has given rise to a system which is the glory of the German nation. Measured by the German standard, we lack a bureau of central control, making its influence and authority felt throughout the State. The mission of such a bureau would be to organize, in connection with county and city superintendents, who should be experienced educators and not politicians or place-hunters, first, local responsible boards of control; second, an organized system conveying its authority and its benefits to the smallest hamlet, and controlling private and endowed schools so far as they claimed the benefit of the common system. We should have uniform standards of examinations for teachers by competent scholars, orderly and progressive courses of study, and instead of anarchy in text-books, such a system as would make uniform our public instruction; in place of the chaotic and the multitudinary courses, the transient whim of a temporary and often inexperienced principal, or uneducated school board, there would be a harmonious system. Scholars removing from one village or city would find at once their appointed place in corresponding schools; higher schools would be found in the most important centres; uniformity of examinations and systematic inspection would make the preparation for college equal or equivalent, and the most important element in national growth would not be left to chance, but the education of every citizen would become the duty of a fostering State. We should approach Hamilton's original conception of the

province of the university, and advance by methods which have yielded the fairest fruit in other nations. Such a system will be found compatible with local liberty and individual rights.

REMARKS OF PRINCIPAL G. C. SAWYER.

Mr. Chancellor and Members of the Convocation.— The interesting paper just read suggests by its careful treatment several trains of thought.

In my opinion the weakest link in the chain of education which, beginning with the primary school ends with the university, is that which connects the academy or high school with the common or grammar school. I have been trying for some years to find out what our children in the public schools are doing between the ages of eight and thirteen. More time is lost at this stage than at any other of their school course, and then, all at once, the high school or the secondary school must take them up and do a great deal with them in a comparatively short time. If we are to fit pupils so as to enter college at the age of sixteen or seventeen, the age approved by Dr. McCosh, we must have them better prepared than they now come to us, after having spent all these preliminary years in poring over definitions in English grammar, specific points of geography and the multitudinous details of arithmetic. Unless we insist upon improvements which will bring us candidates with fresh and vigorous as well as youthful minds, we shall continue to find it difficult work to begin to cultivate their faculties at the point where they should come to us prepared to strike into a higher course of training.

There is no grave defect in our public school system than this— not merely the divorce between the college and the high school as deprecated by Professor Hewitt, but the divorce between the high school and the common school. And I esteem it a misfortune that the convention of State superintendents and teachers who are in charge of education in those schools, meets at such a time elsewhere that we cannot have present each year with us some of those gentlemen for mutual conference.

Where it is then really the weaker, the chain most needs strengthening, and then manifestly, if I am correct, there will be less strain in the high school.

As said by Dr. McCosh, why not begin Latin at the age of nine? To illustrate by personal experience, I can say that I began the study of Latin at the age of eleven, and entering Harvard College at sixteen I had read more Latin than is now required, notwithstanding what is said of the advanced requirements. In these early days the Latin school, taking the pupil at the age even of nine and ten carried him along with the Latin as well as what we now consider the only elementary studies which must first be studied, even to much higher advanced arithmetic, which, if needful at all, should be relegated to a later stage. This burden of

arithmetic, and, still more arithmetic rests like an incubus upon the mind of the pupil and of the sympathies of father and mother also, in these early years of school life. By introducing Latin and other culture studies such as a more rational study of grammar, this most promising period of the child's life may be relieved of some at least of its merely mechanical features, which make the school routine often wearisome, and depress the vivacity and stifle the originality of the youthful mind. Would not these suggestions, thus early carried out, tend "to adapt the whole course so as to preserve the equilibrium of that system," while also "stimulating free and vigorous thought among the pupils." Is not the complaint made that beginning very early in their course "the children are all pressed in the same mould?" If at the high school we are expected to give "such training as will develop robust, reasoning, sensible minds," the antecedent course must not be made too smooth through fear of beginning definite, even severe training too early. Thus I would like to see the influence of the best thought of this Convocation extending clear all the way down the whole length of the chain of school life. To conclude, as I began, when we shall ascertain what our boys and girls are doing in the common or grammar schools, as compared with English or German children of the same age, and find out whether from the age of eight to thirteen years the time spent is best employed, both in training and in culture, for the beginning as well as for farther advance thereafter in education, we shall, in my judgment, see some of the reasons why it is difficult to get pupils properly trained so as to enter our academies and high schools at the age of thirteen or fourteen, as they should, in order that they may be fitted to enter college at the age of sixteen or seventeen.

Remarks of Principal Joseph E. King.

Mr. Chancellor, Ladies and Gentlemen of the Convocation.— Our line of thought on the relation of academies to colleges, is perhaps sufficiently represented already. I have, however, one thing in mind important enough to be justified in saying it in the presence of these college men. I am disturbed by the thought, and I expect you will be if you agree with me. The admirable paper delivered last night by Dr. McCosh mentioned the fact and deprecated it, that the ratio of college students or increase of college students in the country, in comparison to the population, shows that college education is becoming neglected. I have a reason for that, which is a more emphatic one than "the fact of the late period of life at which students in recent times are accustomed to enter college, because of the financial value of their services to their fathers." The true reason for this lessening of the number of college students, pre-eminently in the State of New York, is that our colleges are smitten with paralysis at their roots by the lack of needed endowment of these institutions which fit boys and girls for college. Students

are only fitted by missionary labor in this State. The academic departments of the union schools, as well as the academies have to wrench themselves in order to provide for the ambitious few who turn their faces towards the college. Boards of education find that, to have a fitting department, to have Latin and Greek and to have the higher mathematics costs a few hundred dollars more, and local taxation is unwilling to incur that expense that an inconsiderable action of the public may be gratified. An endowment from the State or from other sources, throwing two or three or four hundred dollars into the academic and high school treasury would secure that interest. The academy in order to prepare young men for college has to incur a missionary tax of from twenty-five to one hundred and fifty dollars for every one they send. Pray what do they get for it? A beggarly two or three dollars! The sum of $40,000 only is divided among them, though there are now two or three hundred of us to share it. The idea which this paper raised was that a certain great fund is to be distributed according as we pass the higher examination. The Lord have mercy upon us! What a compensation for all the worry and work of these examinations! Many of us, but for the stimulus afforded by them to our students and teachers, would throw them up. The beggarly sop is not worth picking up. I say to you gentlemen at the heads of our colleges, I recognize you as the choice men of our generation. No man will surpass me in the respect I hold you. In making the bulk-heads of your educational reservoirs handsome, look to it you do not suffer the springs which supply them to fail. See that "the complaining brooks that make the meadows green" do not dry up. There was that $60,000 unanimously appropriated by the Legislature to supplement the too slender endowment of the academies and high schools, which was allowed to die by his Excellency, while his signature to that appropriation would have added fifteen or twenty per cent. of young men and women, more than you now have, knocking at your college doors for admittance. See to it that this death at the roots shall stop in some way, and you will have plenty of college students.

Remarks of Professor D. S. Martin.

Mr. Chancellor, Ladies and Gentlemen of the Convocation. — There is one suggestion of this paper which has just been read, which I hope will not be suffered to pass without some notice, without perhaps some action on the part of this Convocation. I felt most deeply interested in the remark made by the speaker concerning the pain he had felt when the intercollegiate contests were given up. I had the same feeling. I lived in the city of New York, which was the seat of the public manifestations of the intercollegiate association, and I saw and heard much of them. I attended the public contests year after year, and witnessed the profound interest and value of that work to the colleges, the stim-

ulous of healthy rivalry and competition among students. The young men of our colleges are engaged in contests of which the newspaper columns are full; such as we heard spoken of last night; base ball, boating, lacrosse — *ad nauseam.* But some of us hunger to see something of the same kind in the intellectual work of the colleges, to see that recognized as a matter of interest and importance worthy to command friendly contest and generous rivalry. I do second most earnestly, the remarks made by the speaker, and wish indeed that the convocation could give some definite expression of its views on the subject. I brought this matter recently before our Phi Beta Kappa alumni organization in New York. Some present know about the reorganization that has been going on, within the last few years, of the Phi Beta Kappa society; it seems that this might be a very appropriate medium, all over the country, for a movement of this kind. But in the State of New York, what more proper body to form an opinion and devise a plan than this Convocation, and what more proper body to execute it than the Board of Regents?

Remarks of Principal C. H. Verrill.

Mr. Chancellor, Ladies and Gentlemen of the Convocation. — I am well aware the time is drawing near when the conference of college presidents is to take place, but I will not take long.

The relation of schools is brought before this body, but it seems to me that one point is lost sight of. While my remarks have reference to the paper read by Professor Hewitt of Cornell University, they will in part have reference to the remarks of Principal Sawyer yesterday. It is no use to complain of the work done in the grammar or primary schools without pointing out the remedy. I have in my mind a remedy. It at least is my honest conviction, viz.: The rule is this, the higher grade must make demands upon the lower grade. To illustrate, the secondary schools must make demands upon the grammar schools and the colleges must make their demands on the secondary schools; they must put it right in the bond, not exactly what they would like to have but what they *must have.* The universities must make their demands of the colleges. Now there is something wrong in this State in the relation of the college to the secondary school. A fact or two will illustrate. A young man in our school who completed the middle year of the classical course, went to a college during the summer vacation and passed his examination to the college and was duly admitted. The fall term thereafter he came right back to our school and during that term passed the preliminary examination in grammar, geography, arithmetic and spelling. Now I say the higher school must demand more. If the college wants better preparation from the secondary schools it must demand it. I remember in New England twenty-five years ago the examination for admission to college was almost wholly in Latin and Greek.

The college professor began to complain that the students were not well versed in geography, arithmetic, spelling and English grammar. As soon as they put it in their bond, as soon as they demanded it, the secondary schools put their work in. Let the higher grade make demands of the lower grade, and then live up to it emphatically. I hope the time will come when no student from a secondary school under the care of the Regents of the University in the State of New York will be admitted to a college in the State of New York without *at least* that preliminary certificate.

XIV.

CONFERENCE UPON COLLEGE EDUCATION IN THE STATE OF NEW YORK.

Classical Requirements for the Degree of Bachelor of Arts.

By Chancellor Charles N. Sims of Syracuse University.

Nothing maintains a position of influence by virtue of its past record. The constantly repeated demonstration of its value alone can preserve any institution, however venerable with age or firmly grounded in the admiration of former generations.

The study of the classical languages as a part of liberal education can only be maintained by continued demonstrations of its utility. Is the study of Greek and Latin a necessary or desirable part of that symmetrical development of the mind to which we attach the distinguishing scholastic honor of Bachelor of Arts?

In seeking an answer to this question, let us first consider the *meaning* of the degree itself. It is certainly intended to indicate a form of education very much broader than is gained simply by the study of the natural sciences, the useful arts or the fine arts. In all those last named there is a special object in view looking to a particular vocation or the cultivation of certain faculties of the mind for a special calling. The fine arts educate for the rhythm of music, the poetic feeling the apprehension of the beautiful. Modern languages are acquired for purposes of practical utility. The study of the sciences is preparatory to scientific industry and exploration. Mathematics trains the reasoning faculties, and history and philosophy prepare us for broad generalizations. The degree of Bachelor of Arts is meant to include, under one expression, that general culture which reaches all the faculties and emotions. It stands for the education of the whole mind — its memory, imagination, reason, feelings. It trains for accuracy of expression and clearness of thought. It represents a preparation for any intellectual calling or occupation which may open to its possessor, and is, as nearly as possible, the ideally perfect education. The study of languages as a part of higher education, has a value universally recognized, and is in many respects unequaled by any thing else.

It trains the memory by compelling it to master and retain a new vocabulary composed of words which are not suggested by any association of ideas. It makes the best exercise in composition by requiring thoughts, presented in one language, to be accurately and elegantly expressed in another. It develops the power of

mental perception, enabling one to apprehend ideas almost independent of language. It gives familiarity with the style of the world's best authors. Incidentally, it acquaints us with much valuable history. Many other indirect but far-reaching advantages attend it; so that, unquestionably, the study of languages is an essential feature of liberal education. Other things being equal, a dead language gives better discipline than a living one, and ancient than modern ones.

Helmholtz says, "The mother tongue and foreign languages, learned by practice only, do not involve the use of conscious logical thinking; though I concede that the feeling for rhetorical beauty can be perfected by them. The two classical languages, Greek and Latin, have in addition to their logical and artistic perfection the further advantage which appears to be characteristic of all the old and original languages, that they, by means of full and distinct forms of inflection, mark with great precision the grammatical relation of the words and sentences to each other. By long use languages are stripped of their inflections, the grammatical forms are sacrificed to brevity and swiftness of utterance. Compare the modern European languages with the Latin in this respect; especially the English. It is this want of grammatical fullness and precision which seems to me to make the modern languages much less fitted for the purposes of education than the ancient."

In discussing the beneficial effects of the study of the classic languages, I shall speak more particularly of the Greek; yet most of what I say concerning it would be true also of the Latin, though possibly in a less degree.

The Greek language is the expression of a completed and wonderfully advanced civilization. Greek art in sculpture and architecture was never equalled before or since. Greek oratory has furnished models to all succeeding generations. Greek poetry, philosophy and logic remain unsurpassed. The Greek language is remarkably pure and homogeneous. It stands almost alone in its exemption from words borrowed from surrounding nations. It scarcely appropriated a term from any cotemporaneous language, notwithstanding its close relation to other peoples. The Latin was not so successful in maintaining its purity.

It is wonderfully exact. Its fullness of inflection, its varied cases, voices, and tenses, made it a vehicle for the conveyance of thought almost perfect. The nicest distinctions of time, of action and passion, of purpose, declaration, wish and suggestion, of emphasis and indifference found expression in it reflecting, precisely, the condition and character of the thoughts conveyed. I doubt if any other language has ever approached it in this respect. It excels all other languages in euphony and rhythm. Its susceptibility for euphonic changes, the variety of arrangement in the sentence of which its words are capable and the prominence it gives to smoothness of sound make its study almost a musical education, and

certainly develop a love of harmony in the student which greatly improves his use of the harsher living languages of our day. Its poetry is original in form and marvellous in its adaptation of purposes, whether choral and lyric for religious worship, or dramatic for theatrical representation. The Greek imagination reached the purest ideals of beauty and the highest conceptions of heroism, thus becoming a teacher of the greatest value.

This language has a vocabulary reaching the wonderful number of 60,000 words, and yet contains fewer synonyms than almost any other. Its words are chiefly generic, many of them containing a large number of meanings and requiring many definitions. As a result of this peculiarity, its study requires a constant exercise of the critical faculties. An author uses a word of a dozen different meanings, which are not nearly synonymous. The selection of a right meaning, giving the best interpretation, and the one most in accord with the drift of his thought, the character of his production and his mental peculiarities, is an exercise in the highest degree improving. It will thus be seen that for the broader culture for which the degree of Bachelor of Arts stands, the study of languages is indispensable, and that of all languages the ancient classics have educational value in the widest extent and to the greatest degree. There is always a certainty about a dead language in the fixedness of its definitions which gives it universal agreement of interpretation. The broad, rich and varied culture of the Greeks adapts their language to the cultivation of every mental faculty and makes it, in my judgment, an indispensable part of liberal education.

Remarks of President E. Dodge.

Ladies and Gentlemen of the Convocation. — I have only a few words to say. I think we are in danger of supposing that discipline and knowledge can be severed, and that pupils can be disciplined without instruction, or instructed without discipline. I do not believe for myself that there is very much value in a discipline that is not the result of instruction, nor do I believe there can be any serious instruction that does not carry along with itself discipline. Why, the very best discipline in the high school and in the academy for the young student is secured to him or to her by the value of the instruction given, and it would be a poor and sorry kind of discipline if it did not result from the knowledge imparted and received. And culture, which is the flower of discipline, comes in the same way. The most valuable questions we can possibly ask are those questions the answering of which goes far beyond the question raised. And that is one of the best measures of the value of any question thay may be asked.

But now allow me to make a suggestion. I believe that it is the duty of men who are engaged in special lines of study, to be careful that they be hospitable to those who are engaged in other lines of work; or, stating the same in other terms, the specialist

in one direction must be careful that he recognizes his brother specialist in a different line of research. Otherwise, we are in danger of sinking from the high plane of teachers to the low level of pedagogues. No matter how much value may be attached to the line that we may be called to move in, my brother who is engaged in a kindred line has his own worth, and his results are to be put on a par at least with my own. Else we take on narrowness, and narrowness is out of place in an age that has so many sides as the nineteenth century. It is well to have our separate convictions and vocations. They are always central. But it is not necessary to change the centre to secure a large circle. We only need to lengthen the radius. And so I always have a feeling of regret when I find the scientist stands opposed to his brother scientist in a different line. For the teacher of languages is a scientist, and the science he deals with is one of the sciences of mind. It does not alter the case, in fact, in some respects, it enhances the case, if we deal not with mind abstractly conceived or individualized, but with national mind concretely expressed in its own language. For language is the great monument which thousands on thousands of daily toilers have reared, working so unconsciously through the long ages — a monument which the leaders of thought could only explain and defend, but could never create. And so the Greek language is the mind that survives and will survive as worthy of study, because it is an expression of the national mind — a mind wonderful in its day for its breadth of comprehension, for its subtle and delicate strides of thought. For the Greek speculative mind has not been surpassed in the realm of philosophy. Do not misunderstand me. In some respects, of course, we have surpassed the old world, because science has contributed to speculation. It is always so. Language and literature depend on life, on the results of living. These results appear in the great leaders of thought, and affect speculation as they affect every other line of intellectual movement. And so in some respects we are better than they. But after all, there is no height yet found in the thought of Hegel, that has not been touched by the hand of Plato. There is nothing in the speculations of our great modern thinkers to which you cannot find the counterpart in the speculative thought of Aristotle and his great teacher. And the Greek language, and so the Latin tongue, deserve to be studied because we can make them objective. What is too near the eye cannot be seen. This very remoteness from our eyes has its advantage.

Hence the difficulty in the study of English language and English literature, only we need not trouble ourselves about that, I think it will take care of itself in the momentum of the great English life to which we belong. That is sure. I do not think however, that language exhaustingly embodies the life of the individual or of the people, because besides thought, sentiment and purpose, there remain the activities of life, its institutions, and its works of

art and works of utility. All these are symbols of the rational minds to which they belong, as truly as language. The municipal institutions of Rome, and the jurisprudence of Rome, are the grand legacies which old Rome has bequeathed to European life, and so to American life, and those are very largely outside of language, except as language may formulate their meaning. Now I want to say just a word or two farther upon the value of the ancient classic tongues. I do not believe that we ought to aim to bring the pupil in our colleges to this point, that he shall have Greek or Latin enough to be able to read these languages with facility. For the specialist this is essential, but only for him. But I think it is desirable that the average boy in college should be able to read Plato with tolerable ease, and that is done in the college with which I am connected, under my respected colleague Dr. Andrews. Still, I do hold, that besides the drill and training in the preparatory school, there ought to be the higher training and the higher drill that belongs to the advanced study of these tongues, and that he ought to be able to master the specimens of Greek thought or Latin thought, or Greek sentiment or Latin sentiment, as they are embodied in classic literature. The student ought to be able to master the best specimens of Greek and of Latin thought — be made familiar with the literature of the old world. For to study language irrespective of literature is to put the means in the place of the end, in fact to confine the pupil to the study of the language alone and not to introduce him to Greek eloquence or to Greek poetry is, it seems to me, the height of absurdity. So I have favored very earnestly the idea that the teachers in Greek and Latin should have their essays and should give lectures and aim to advance all the time from the language to the literature which it embodies. One thing more, we mistake when we confine ourselves exclusively in our analysis to what language will do in the way of culture, and then confine ourselves to what mathematics will do, and then what natural science will do. It is the cross fertilization of these different lines of culture which secures the best finished results. When these lines penetrate the one the other, then you have the highest and broadest culture; then you secure a symmetrical growth of soul, and so make mind, and that is worth more than making money. I cannot accept the view that the college course is pre-eminently fitted for the man of business. It is enough for me if it does not interfere with him. That is not its supreme end, it lives for a higher aim; it assumes that when a man has got through his business there is something of him still left. There is his personal character, and his grand human worth. When we get through our business and go to our homes, or enter into society, or engage in the larger work of public life, we need to be something more than business men. For that greater and higher end, we must have discipline and broad culture, and all the power and grace which education can give us.

Remarks of Warden R. B. Fairbairn.

Mr. Chairman, Ladies and Gentlemen. — I think we labor under some disadvantage in not having before us a more distinct subject, or at least in not having the subject for our conference contracted into a narrower compass. In the programme it is announced as "the requirement of Greek for a bachelor's degree." As it has for several days been before my mind, it appeared to me to be a very wide subject, and I felt that I should be in the condition of the man described by President Potter who fires a blunderbuss against a barn door.

We are called on to express our opinion in regard to the study of Greek as a requirement for the degree of Bachelor of Arts. The question has been brought into some prominence by what has been said recently against the study of Greek as one of the necessary requirements for a degree in the liberal arts. And it acquires importance also, because it has been brought into comparison with the study of natural science.

The real question which comes home to us teachers in college is this: What is the work which we are called on to do? At what are we aiming? What is it we wish to do for these young men who are entrusted to us? When they have come to the end of our course and have taken their bachelor's degree, what do we say that we have done for them? In what respect are they better men, more able to do the work of life, than when they entered our college? You hear a great deal about the knowledge which is imparted in college. You are told that these young men are going out into the world with a certain degree of knowledge — knowledge of language, knowledge of mathematics and knowledge of science. And you will also hear it said that these young men have, in certain subjects, very little knowledge, and that they are unable to impart knowledge to others. Now it is not knowledge at all, except as it is subordinate to a higher purpose, that we are aiming at. Education, and especially collegiate education, does not necessarily mean information, knowledge of certain subjects. But is not this the purpose which we have in view — the development of the human being that has been entrusted to us when he comes into our college as a freshman. We say that he is rightly named. He is not in a condition to deal with the world. He does not know his own powers, and the capacities of his own mind. He is not capable of telling you what he is able to do. But when he gets through and is decorated with the bachelor's degree, we suppose that those powers of his mind, those capacities and abilities which belong to him simply as a human being, have been called into exercise; that he is now able to make use of them; that he is now able to pursue any independent course of study that he may choose; that he is now prepared, in a measure at least, to go out into the world and to deal with men. That is what we ought to aim at in education. Educating, drawing out, forming the man,

that, it appears to me, is the purpose of a collegiate education. That is what we seemed to decide on in our discussion of Tuesday. It was clearly and distinctly placed before us in the able paper of Professor Williams of Cornell University, what education is. Education is to make men; to call out their powers and capacities so that they can take their place in the world among other men, and exercise their influence over men. The college is not a university. Young men do not go to college in order to gain information in the four faculties of philosophy, theology, law and medicine. They only seek this information when they have become educated men. When they enter into the university they are preparing to take their place in the learned professions. But when they are in college they are simply preparing to enter on that work. It appeared to me that some things said the other day showed that the college should keep within its bounds, and not trespass upon the functions of the university. Now have not the Scotch expressed this when they call classical studies the *humanities?* It is the purpose of these studies to develop all the powers which belong to man, and to call into exercise all those faculties which will make them to be men moving among other men. The only question with us is, how shall we do this? It is through the classics that it has chiefly been done for centuries. Have we, towards the end of this nineteenth century, discovered a new method better than that of our fathers? Have we discovered a method which will call out the powers of the mind, make men more humane, which will better develop their capacities as human beings, and which will send them out into the world better prepared to exercise their intellectual capacities? Have we, I say, discovered a new method of study, the study of any other language or any department of science, that will do this better than it has been done heretofore? Have we been making a mistake which it now devolves upon us to correct? I do not intend to say anything especially bearing on the benefit of the study of Greek or of Latin. The only point which I am endeavoring to get before you is this; whether this study will call out these powers and will bring them into exercise in a higher degree than any other study, than the study of any other department of literature or science.

The whole English language is saturated with Greek modes of thought, with Greek ideas and Greek words. It is filled with Latin words and Latin modes of thought. If you educate a man in English you are educating him in the language that he must speak, in its words and in the modes of thought, as his fathers have spoken it, and as they have thought it. If you abolish from your course of study these two learned languages, the Greek and the Latin, and educate your young men through other languages you would almost make a foreigner of him. He will afterwards have to read the history of his own literature in order to bring himself into harmony with it, into communion with the literature

which prevails in his own native tongue. I therefore say for myself, that such is my respect for the mode of education of our fathers, that when I look upon the men whom they have developed, the character which they have called out, their character as intellectual and moral men, I do not see that you could do their work in any mode more effectually and more successfully than in that in which it has been done.

It appears to me that if we are to make any change in regard to the study of these two languages it might be in confining ourselves to a smaller number of books and to a more thorough reading of those books. For instance, a young man enters one of our colleges after having read six books of the Æneid. He knows very little about the poem, very little about the story, and very little of the persons who are gathered around the base of the poem. So when he goes into college he reads a book until he begins to get a little familiar with it, and then another is put into its place. And this plan continues through the whole college course. It is a sort of Tantalus operation. The moment the water gets to his lips it is withdrawn. The moment the student begins to enjoy in some degree his author another is substituted for it. I do not wonder that under such circumstances young men do not acquire a taste for Latin and Greek authors. My plan would be, that on his entrance into college he should take up his Virgil again and read the Æneid through, even if it takes him into the Sophomore class. I would have him keep to it until he could read it with facility, could tell the whole story, could become acquainted with all the human relations which it sets forth in such an inimitable way. And then I would teach him to read one of the poems of Homer in the same way, the Iliad or the Odyssey. I would have him commence it with the freshman year and read on; I do not care when he may read it, at what portion of his course, but I would make him go on and read that book, the Iliad, until he has read it through, and can read it with facility, and until he is acquainted with the hero and all the subordinate persons of the poem. It appears to me that he would then refer to it as one of the great pleasures of his life. It would tend something towards forming his intellectual character. It would teach him to do a thing by wholes, to know the book that he reads, to know its language and its literature. Then I would have him read a Greek play and one of the plays of Terence; then one of the philosophical works of the Greeks and one of the Latins; for instance, the ethics of Aristotle and the *De Officiis*, or the *De Finibus* of Cicero. Let him master these works to such a degree, at least, that he will become familiar with their thoughts. Confine him to these and you have taught him a great lesson, that he is to read and become the master of that book. This is one mode, it appears to me, of making use of a Greek author in the course of study for a bachelor's degree. If I could control even the things that I am placed over, I promise

you that these plans should be thoroughly carried out and that a young man, when he comes to receive his degree, should be master at least of one Latin and one Greek book, so that he could read them and understand them, so that he could make their thoughts his thoughts.

I wish, sir, to say one word more. We often hear of science being put into the place of the classics. This, it appears to me, is quite an indefinite way of putting the matter. What is science? It is placing things in their rational relation to each other. Are we not studying science when we study language? When we study logic, psychology, moral philosophy, natural philosophy and astronomy? And what college, I would ask, does not study these various departments. The person who goes in for Greek, does not confine himself to this one language, but he studies also logic, psychology, moral philosophy, natural philosophy and astronomy. That is studying science. They embrace one-third of the course. Nearly every college in our country embraces in its course these scientific studies. But if you study even these sciences without the Latin and Greek classics you are making a partially developed man, a one-sided man. You are then developing only some qualities of the mind. You are not producing a real man ready to sympathize with every question. You are not bringing into operation all the powers of the human soul, and formulating a harmoniously developed man, ready to take his place in the world and to bear his share in its affairs. This is the conception which I have of a collegiate education.

You will bear me witness that I go in for the study of certain sciences as I do for the study of certain languages. And I say that these sciences are just as necessary for the development of our nature, for the harmonious development of all our faculties as are the languages. One without the other will not perform the work which we wish to have performed. We, therefore, unite them and together they bring out this harmonious development, and make men capable of exercising their functions. I am not opposed to the study of any science, or of any facts in nature whatever. I am heartily in favor of the study of all facts in all the departments of nature. They should be thoroughly investigated and placed in their rational relations to each other. But when you ask me how to educate a boy of sixteen, and keep him in a certain course until he is twenty-one, so that he shall be a thoroughly developed man, with a mind capable of exercising the functions which belong to it, then I say that he should be kept to Latin and Greek, but let this study be tempered with the sciences which I have named.

Remarks of the Rev. James Conway, S. J., of Canisius College, Buffalo, N. Y.

Mr. Chancellor. — I did not expect to be called upon to speak before the Convocation, and must therefore confine myself to very few and brief remarks. And first I must say that I have been highly gratified by the able and brilliant defense of the classical studies, which I listened to this morning, from men who have grown old and have a record in the noble work of higher education. I express not only my own sentiments, but those, also, of the faculty to which I belong, and particularly of the president, the Rev. Theodore Van Rossum, when I say that I consider the classical studies of the highest moment; nay, that without a thorough knowledge of the classics, Latin and Greek, no one can put any claim to a liberal education.

Much has been said, and justly said, in praise of the German curriculum in this Convocation. Now, I wish to inform the members of the Convocation, whom it may interest, that the curriculum of the German gymnasium has been from the beginning introduced in Canisius College and carried out with gratifying results. Those in charge of the classical department, who are themselves, for the most part graduates, of the German gymnasium and of German universities, unanimously agree, that after six years of study of the Latin and Greek classics, they turn out Latin and Greek scholars fit to compete with the *Abiturienten* of Germany, who have completed the gymnasium and are admitted to the universities.

Before sitting down I may be allowed one remark more. I should like to draw the attention of the Convocation to the necessity of a more accurate study of the elements of grammar. Without a solid foundation there is no possibility of building up. Now, it seems to me, that there is a tendency to make the work too easy for the student. The consequence is that the desirable degree of mental discipline and development is not attained to, and that what is learned is but imperfectly learned and soon forgotten. I have come to this conclusion from the examination of many students, whom I invariably found deficient in the rudiments, and from the examination of many grammars, both Latin and Greek, and other elementary books which seemed to be in great demand, and which commonly discovered this tendency. These books are calculated to impede, not to promote, scholarship. I was therefore much pleased to see that in the discussion of yesterday the system upon which these books are usually based, the so-called natural system, was almost without a dissenting voice reprobated by this Convocation. I will not trespass any longer on the attention of the Convocation at this late hour of the session.

COMMUNICATION FROM HOBART COLLEGE.

To the Twenty-fourth University Convocation and for the conference upon college education in the State, July eighth, I respectfully present the following views of my colleagues, regretting that I am prevented from attending in person.

E. N. Potter,
President Hobart College.

Hobart College,
Geneva, N. Y., *June* 28, 1886.

Reverend Dear Sir.— I am directed to furnish you in brief with the views of the classical faculty of this college on a much debated issue. The question somewhat disingenuously called the "Greek question," though really involving all the ancient languages, may be discussed in two principal aspects.

First. It may be debated without reference to the policy of this college, whether the course of study which leaves out the classics affords that which is justly expected from a "college education." As to this point your classical faculty have seen no reason to change the opinions received from the elders, that the classics are an integral part of the culture which is known as a "liberal education." In their view, the attempt to evolve refined modern culture from a mere accumulation of "useful knowledge," without reference to that ancient culture upon which all that is refined in modern culture reposes, is as unreasonable as it would be to look for the crowning foliage and fruitage of the tree without the intervention of roots and stem to support them. But in this aspect the question is too large to be discussed in a report of this nature.

Second. The question may be regarded from the point of view of the future policy of this college. On this point your classical faculty would briefly report as follows:

It may be said without disparagement of those who honestly undervalue the classics as a means of education, that the anti-classical party owes its numerical strength to those who desire to reduce the cost, in time, work and money, at which they can purchase the *social distinction* of a "liberal education." If they merely desired the privilege of studying science untrammelled by Greek and Latin, who hinders them? There would be no such clamor as is now raised. But they deem themselves to have nothing, if denied that particular degree of A. B. (which from time immemorial has implied the classics), at the end of a course from which the classics are omitted. Why all this clamor for these two letters of the alphabet, when the other twenty-four are so entirely at their service? The answer is plain. No other letters but these would deceive the public. The degree of A. B. is desired by the multitude simply to cover the nakedness of an education which is not a culture; and there are those among the leaders of that party who, understanding this as well as we do, avail themselves of the degraded and degrad-

ing popular demand, to insure the triumph of their own educational theories.

In this state of things your classical faculty believe that the safest policy, in the end, is still that of perfect honesty. They cannot think that what rests upon a fraud will prove durable. Already there are visible signs of a reaction against the violent and hasty "reforms" of the "new education" as it most questionably calls itself. It is not impossible that the very colleges who have been bidding for ephemeral success by these alleged reforms may yet retrace their steps. But what if they should not? To this question your faculty are in no perplexity for an answer.

The debasement of the degree of arts by those to whose keeping its administration has been confided may be compared to the issue of irredeemable paper money. As this does not represent value, it soon loses credit; and loses it in spite of the most stringent penal laws. Such must undoubtedly prove the fate of the debased A. B. degree, if the theories of the anti-classical education shall ultimately prevail. It will fall into general disrepute; and, in the course of a generation or two, it will have ceased to deceive the public and will therefore be of no further value, even to those who now clamor for its debasement to their own level.

But when the worthlessness of an irredeemable currency becomes apparent the true coin has suffered no diminution of value — nay it has gained a fictitious value above par on account of its scarcity. It will be so, sooner or later, in this matter of education. The public will discover that the A. B. of certain colleges does not imply real culture. The public though too easily satisfied, for a time, with names, demands realities in the end, and rejects sham. When that time comes, it will turn to those colleges where the tradition of true culture has been handed down undefiled and in its integrity.

In view of these facts and forecasts, the classical faculty of Hobart College are of opinion that no change should be made in the requirements for the degree of Bachelor of Arts.

On behalf of the faculty of the Classical Department.

FRANCIS PHILIP NASH,
Hobart Professor of the Latin Lang. and Lit.

I heartily indorse the preceding statement of my classical colleagues.

H. T. Smith,
Professor Nat. Phil. and Astronomy.

The Rev. E. N. Potter, S. T. D., LL. D.
President of Hobart College.

XV.

REPORT OF THE COMMITTEE ON NECROLOGY.

By Assistant Secretary Albert B. Watkins, Chairman.

It is the mournful duty of your Committee to report a large number of names of former members of the Convocation who have, during the past year, gone to their final reward. The list is notable in its *personnel.* Early in the year Vice-Chancellor George W. Clinton suddenly and peacefully departed this life, leaving behind him a merited reputation for integrity and ability and true culture, and a record in the hearts of all who knew him well, made by a life of singular purity and sweetness.

The death of Principal Fred. N. Wright removed an energetic and successful teacher from a new and promising field of labor and a representative teacher and principal from what had promised to be a long and useful career.

Esmond V. DeGraff, although formerly principal in the public schools in the State, was best known as a very successful instructor in teachers' institutes, possessing wonderful enthusiasm in inspiring young teachers with a love for the work upon which they were entering.

In the death of Dr. J. Dorman Steele, every member of the Convocation will feel that he has met a personal loss. His genial, social nature; his wide and successful experience as a teacher; the extensive use of his text-books, made his name a household word throughout this and other States. None will be more missed among our number, and no vacant seat will recall a kinder heart or more precious memories.

To these we must add ex-Regent Augustus C. George, and Principal George H. Barton who had done faithful service in this State, but more recently had been taking high educational rank in a neighboring State; Principal James Gilmour, who for many years fulfilled the duties of principal while struggling with disease; Principal A. K. Goodier, for many years principal of an academy; Principal Henry Arthur Smith, who had but just began with energy and enthusiasm his chosen life-work; Professors John C. Draper and S. J. Armor, well-known in the medical world for their ability and success in their chosen calling; and the venerable ex-President Joseph Alden, who so long and so ably, in various educational positions, did such faithful and valuable work, but especially as a writer of text-books and as head of the Albany State Normal School.

A suitable memorial minute in regard to Vice-Chancellor George W. Clinton was prepared by Regent George William Curtis, and read at the annual meeting of the Board of Regents in January last. The addresses made upon that occasion, together with the minutes, will be included with the necrological notices prepared for this Convocation, and all will be published with the proceedings of the Convocation.

VICE-CHANCELLOR GEORGE W. CLINTON.

[Extract from the minutes of the Board of Regents.]

January 14, 1886, 8 P. M.

Annual meeting of the Board held in the Senate Chamber.

* * * * * * * * * * * *

The Chancellor arose in his place and said:

Regents of the University.—You have elected the present officers for the ensuing year, but there yet remains a vacancy, most conspicuous, indeed I may say, unique.

In September last, after attending to his duties, until the cool of the day, George W. Clinton, the Vice-Chancellor of this Board, entered into his rest, amid flowers and fragrance, he was gathering for instruction and amusement. As a Regent, as an editor of the Clinton manuscripts, as Vice-Chancellor, he had no peer. Since 1881, when he came from Buffalo to this city, to take upom himself the work of arranging and indexing the George Clinton papers, his presence had emphasized his work as Regent from 1856, and as Vice-Chancellor since 1880, and we grew familiar with a character hitherto veiled by a natural reserve and modesty, but yet known enough to be always respected and admired. He was a rare man. His tall lithe form, his graceful and pleasing manner, his keen eye and sagacious judgment, his wise and prudent counsel, and his artless and ingenuous companionship made him a most valuable friend, officer and counsellor of this Board. He had few equals; certainly no superior.

I dare not venture to pronounce his eulogy, that will be left for others. It was expected that Regent Curtis would perform that duty, but I have just received a letter announcing his illness and sending me a minute, which I will now read to the Board.

"The Board of Regents of the University desire to place upon their records a permanent memorial of their warm affection and high respect for their late associate, counsellor and friend, Vice-Chancellor George W. Clinton.

"Judge Clinton belonged to one of the historical families of New York. The son of DeWitt Clinton, the grandson of James and the rgandnephew of George Clinton, and on his mother's side the grand-

son of Walter Franklin, one of the great New York merchants of the last century, he had good reason to feel, and his life honorably illustrated the feeling, that *noblesse oblige*.

"Born in Albany in 1807, and graduating at Hamilton College, then called Clinton; he had nearly completed his studies in medicine, but upon the sudden death of his father he turned to the law which he made the profession of his life. Marrying a daughter of John C. Spencer, he went as far west as Cleveland, Ohio, but after a short stay returned to his native State and made his home in Buffalo. There, without his solicitation, President Van Buren appointed him collector of the port. Afterward he was appointed district attorney of the United States, and he was elected by both parties mayor of Buffalo. Upon the establishment of the superior court, he was chosen first judge, and remained upon the bench as judge and chief justice until the law which limits the age,— and which in his case was much harsher than time itself, removed him. Sprung from men with a genius for public affairs and renowned in public service, a high political ambition would have been but natural to Judge Clinton. But a noble independence and candor of disposition and a deep delight in simple and friendly intercourse with nature made him a student with Linnaeus, a loiterer with Izaak Walton and a shrewd observer with Henry Thoreau; and drew his heart away from the contentions of politics to a more tranquil life, from which even the offer of a seat in the cabinet of President Buchanan could not divert him.

"Judge Clinton was the founder of the Society of Natural Sciences in Buffalo, and he lectured frequently upon geology and botany, and the last study was his special consolation and delight. Had there been in Buffalo, as in the English universities, the office of a public orator, Judge Clinton would have worn its laurel, so constant and so various were his addresses upon all occasions of public interest and ceremony.

"In 1856 he was elected a Regent of the university, and in 1858, he completed a digest of the law reports to that date. After leaving the bench he was appointed to edit the Clinton papers, a collection of great importance to the State and country; and to this most fitting and congenial task the last years of his life were devoted. His annual reports of progress in that work full of characteristic insight, of humorous appreciation, and of patriotic enthusiasm, were among the most interesting events of the annual meeting of this Board. His judicial and sagacious mind, his large knowledge of the interests and activities of the university, and a gentle conservation of temperament gave to Judge Clinton's views great and just weight. He had a certain chivalry of nature which in moments of high excitement inspired him with fiery eloquence, to which his towering form, his flashing eye, and swift impetuous speech lent great impressiveness. His kindly smile and courteous dignity of manner reflected well the purity of his character, and

his peaceful life, which his fond association with nature kept always fresh and unspoiled. The end of this modest, serviceable life was as happy as it was sudden. Already an old man, Judge Clinton walked out in the autumn afternoon to find the latest lingering flowers of the year, and in that search, which had been the joy of his life, without warning or failure, or decay of his faculties, his life suddenly ended. Nature seemed to have reclaimed the old man whose heart, the love of her had kept as warm and unwasted as a child's. Like Enoch in that tranquil, beneficent, blameless life, he had walked with God, and God took him. Dying in the lap of nature we may truly say of our beloved friend what Emerson said of another student of the fields and woods:

> 'Then will yet my mother yield,
> A pillow in her greenest field;
> Nor the June flowers, scorn to cover
> The clay of their departed lover.'"

Regent Bostwick said:

"*Mr. Chancellor.*— After the just and fitting memorial to which we have just listened, perhaps silence would be most becoming in me. But, sir, I cannot resist the impulse to add a single word in tribute to the memory of our loved and lamented Vice-Chancellor.

"His death came upon us so suddenly, that although not unmindful of his advanced years, we were yet unprepared for it. For more than a third of a century, Judge Clinton has been a faithful member of this Board; his presence always brought cheer to his associates, and his counsels were inspired by a zealous devotion to the cause of education, and characterized by sound judgment. His life has been so useful, so gentle, so pure, so fragrant, that all who were associated with him or came under his influence, have been encouraged and benefited. His sympathizing nature went out to all mankind; the grasp of his hand had a warmth of love; the look of his eye gave assurance of kindness; the words of his mouth were those of friendship and good will. He was especially interested in young men; none ever approached him for counsel or information to whom he did not give a listening ear; none left him without a stouter heart and a more determined purpose. Judge Clinton had a just and peculiar State pride; he believed in her institutions and her traditions.

"He was proud of his patriotic ancestry. He loved his fellow men. We shall long miss him as an associate and friend. His memory will be sacredly cherished by us. Of George W. Clinton it may be said, the world is indeed a loser when so good a man dies."

Regent William H. Watson, of Utica, then said:

"I fail to find words to fittingly express the sense of sadness and deep personal loss with which, while in a distant State, I received the telegram which announced the death of Judge Clinton.

Denied by reason of distance the melancholy satisfaction of standing beside his grave at Buffalo, busy memory brought in instantaneous and rapid review before my mind, the strongly marked and characteristic traits which made him what he was. I recalled the guileless simplicity of his heart, and that peculiar gentleness, combined with dignified urbanity of manner, which, while it detracted nothing from the masculine strength of his character, yet gave to it an additional element of beauty that denied to our sterner sex, is usually only to be found in the character of woman. Descended from one of the most illustrious families in the annals of our State, which had frequently and amply vindicated its fitness for most exalted political position and extended influence in the councils, both of the State and nation, Judge Clinton, *integer vitæ scelerisque purus*, alike by his ancestry and the traditions of his race, was, to a certain extent, constrained to be the character that he was. Kindness and benevolence were among his most prominent traits. Money he could not retain, so strong were the impulses of his heart to part with it to those whom he supposed to need it more than himself, nor could he ever refrain from gently drawing the veil of charity over the acts of those who differed from him, and who had treated him ungenerously and unkindly. It was, indeed, the poetically fitting close of the life of such a man, so intimate with nature, and so fond of flowers, that our departed colleague, in the autumn of a well spent life, should have gently sunk to rest amid the fading blossoms of the dying year."

Regent St. Clair McKelway said:

"*Mr. Chancellor.*— With unfeigned reluctance I rise to speak, what shall occur to me, while on my feet, concerning the career and character of George W. Clinton. I shall trust to your forbearance to pardon the imperfection of the words which I shall unpremeditatedly utter out of a sincere affection for the noble gentleman who to me was mentor, confidant and friend. I did not know him long but came to know him well. The duration of our intercourse measured by years was short. It was, however, punctuated with many occasions of conference and companionship. He began his residence and labor in Albany, before I received from the State, the educational trust I hold. I had been in a little degree instrumental in securing the opportunity for his employment as editor of the papers, in which he dealt with the record of his ancestors while arranging the most precious archives of the Commonwealth. Of my slight agency in the matter he was appreciative beyond its deserts. His courtesy, gratitude, dignity and simplicity were captivating. The urbanity of a gentleman of the old school shone in every movement of the venerable, and to me beautiful form, which was the temple of a gracious and exalted man, and of a childlike heart, not more guileless of evil in infancy than in age. On my entrance into this Board, he gave me a wel-

come not lost in the rendering. It translated and diffused itself into many acts of paternal service and helpful advice. We labored on the same law matters. We had in charge identical interests. He was always wise, deliberate, earnest, sunny and just. To be associated with him, was a liberal education in the amenities and equities of public employments. To every servant of the Board he was considerate, thoughtful and for them all he had a veritable affection. To the honor and welfare of the State he was loyal through a habit of conscience. To his associates in the University he was cordial; he held their rights and reputation very dear; by them all he was revered. We shall never, never look upon his like again. His was the faithful service of the antique world. Vice-Chancellor Clinton was splendidly prepared for his duties on the earth. He came from the family that has made on our State a stronger and more benign impress, than any other family in its history. His childhood was passed in the society of warriors, statesmen, jurists and philanthropists. He studied nature while he went to school to books. He studied nature while he went to school to life. He studied nature while a federal functionary, while a judge, and while an editor. He died in the study of nature, and fell asleep like a tired child on the bosom of the mother of us all. I take his efficiency in a large variety of high callings to be considerably due to his early intercourse with the great; to his innate love for noble ideals; and to his constant study of the works and wonders of God, in the forms of beauty, with which He has filled the vegetable world, and studded it with appeals to the senses, and to the heart. Had George W. Clinton not been an able magistrate, he would have been an eminent scientist. Had he not been reserved for public affairs, his drawings toward medicine would have made him a great physician. Had he not been called in his old age to revise the records of the State, his place among the essayists of the time would have been distinguished. In truth, there are few of the great departments of activity, which he could not have made greater by pursuing them. We know that as a Judge he sought to make law and justice synonymous and mercy their handmaid. We know that he tried to arbitrate and decide as seeing Him who is invisible. We know that had he on any night of his probation been called to his account, like Samuel he would have been ready, like Enoch he could have walked with God, for he was not disobedient unto the Heavenly vision. Because he was never self-assertive, grosser men distanced him in the race for preferment. He stopped by the way to gather flowers and love little children. Yet great, as gentle as great, he was. He was learned, sagacious, the soul of honor, replete with charity, studious, catholic, diligent, and his ear and soul were attuned to the sweet, sad music of humanity. Inquiry found him ready to answer it. Perplexity found him willing to counsel it. Suffering found him eager to aid

it. With money he could not be trusted, for palms of pleading knew he would fill them. Of his home life I would not permit myself to speak in detail here. It was ideally happy and beautiful. Before he went forth on his last walk, he placed in the lap of his wife a bouquet of elegant flowers, for he was lover as well as husband all his years. Then he went out under the September skies, to the chaste solitudes of the dead, to pluck from hidden nooks and vernal slopes more flowers for study and for grouping. While reaching out to gather them, a single gentle pressure on the citadel of his life stilled its forces. He gave as we may fondly believe, a final thought to her from whom he had just departed. Then in on his enlarged view broke the beauty of Heaven, as God's glory smote him in the face. How enviable and perfect was his exchange of worlds! Here at peace with all. In an instant there, amid the saints of all ages, with all his faculties renewed in eternal youth, and with a character ripened by faith and works for the service and the society of the blessed forevermore who die in the Lord." * * *

REV. AUGUSTUS C. GEORGE, D. D.

By Regent O. H. WARREN.

The Rev. Augustus C. George, D. D., was born at Avon Springs, N. Y. He was educated at Genesee Wesleyan Seminary, Lima, N. Y. Soon after his graduation there he entered the ministry of the Methodist Episcopal Church, in connection with Genesee Conference. During the next eighteen years he served important churches in Western New York, and as presiding elder of Elmira and Rochester districts.

In 1865 he went to St. Louis, where he was pastor of Union Church and Central Church in that city. In 1872 he returned to this State, and became pastor of the First M. E. Church in Elmira. In 1876, while pastor of the Centenary Church in Syracuse, he was transferred to West Virginia conference, where he served as pastor first at Wheeling then at Parkersburg. From this place he went to Chicago, where he was for three years pastor of the Centenary Church. Near the close of his connection with this church his health became impaired, and though he received another appointment, he was unable to discharge the duties of the pastorate, his health gradually declining until he passed away in death, at Englewood, Ill., August 7, 1885.

In 1876, Dr. George was elected Regent of the University of the State of New York, which position he resigned a few months later on his removal from the State. His election as Regent was a recognition of the intelligent and active interest which he had shown

in the cause of education. To this cause he was drawn by his intellectual sympathies and habits. Professor Charles W. Bennett, who entered the seminary at Lima as young George was about to leave it, and who knew him intimately then and through his subsequent career, says of him: "As a student he excelled; there was a vigor and grip in his thought that immediately arrested attention and compelled respect. His methods of study were original and his thoroughness such as made him a favorite with the teachers of most virile intellect."

Dr. Bennett further informs us that at that time his writings exhibited great strength and originality of thought, and that those whom he honestly opposed in argument "dreaded his assaults whether by vigorous logic or biting sarcasm." It is not improbable that but for the demand in the ministry of his denomination at that period for young men of such gifts — a demand which was readily yielded to immediately after his conversion, which changed him from an opposer into an enthusiastic advocate of the Christian faith — he would have gone forward in the pursuit of higher education and placed himself in the front rank of the scholars of his generation.

But he never ceased to be a student, and his love of knowledge, together with his lively interest in all public questions, his broad views of public policy and his eager participation in all efforts to promote the public welfare, made him an earnest supporter of the schools and brought him into close relation to important educational enterprises.

Those who knew his ability and his broad practical views of all public questions greatly regretted the necessity that so soon severed his connection with the Board of Regents.

Dr. George wielded a vigorous pen. He wrote a number of books and pamphlets bearing upon different phases of religious thought and work, which met with a large sale. His pen was in constant demand by both the religious and secular newspapers for articles contributed in his own name and for editorial leaders on the most important topics of the hour.

In his death, christianity lost an able and effective minister, and education one of its most earnest advocates.

Memoir of J. Dorman Steele, Ph. D.

By Chancellor Charles N. Sims.

Among the teachers of the State of New York, who have done superior work, exerted large influence and left an endearing memory, is Professor J. Dorman Steele, Ph. D., who died at his home in Elmira, on the 25th of last May.

It is altogether appropriate that a sketch of his life should be presented to this body, and I can only regret — since the task has been committed to me — that I have not had time to do the work better. Dr. Steele was the son of an itinerant Methodist preacher, and was born in the parsonage at Lima, N. Y., on May 14, 1836. His early life shared the wanderings of his father's calling. At the age of seventeen he taught his first school, receiving a salary of two dollars and fifty cents a week and "boarded around" among the patrons. Before the term was out he left the school-room for the harvest field. He did not return, and another teacher took the place. The next year was spent in New York city, where his father was pastor of a Church. During this time he was employed as a clerk in a publishing house. In 1854 he entered Genesee Wesleyan College at Lima, his birthplace. He was compelled to rely in good part upon his own resources for college expenses, and after using the utmost economy, found himself in debt at the close of his course. He was a diligent student, and relied more upon his work than his genius — indeed, he placed a very humble estimate upon his own mental ability. He says of himself, "I was ambitious and yet found myself in competition with young men of greater natural ability and far better preparation. I had, however, the gift of perseverance. Others might learn more readily, but I could study more hours."

His industry soon placed him among the foremost of his class, and when Commencement day came he had very thoroughly mastered the studies of the whole course. From college he returned to the farm, waiting for some opening or indication of his life-work. A letter from Professor John R. French, then principal of Mexico Academy, and an entire stranger to him, invited him to the work of an assistant teacher. He accepted the position, and when a year later Dr. French resigned, in order to enter upon the practice of law, Professor Steele was chosen his successor. During his year he read the six books of the Æneid through seven times, using every collateral help of notes, grammars, and classical Dictionaries. He adopted the plan of giving to the class, each day, a translation of the next day's lesson in the best English he could command, and required of them in recitation a translation as accurate and elegant as they could make.

While here, he was married to Miss Esther Baker, who thereafter shared all his literary labors. In the autumn of 1861, he assisted in raising troops, and entered the army as captain of Company K, in the Eighty-first New York Regiment of Volunteers. He received a wound in the battle of Fair Oaks, from which he suffered long and severely, and which, together with continued camp fever, compelled him to resign his commission. When, after long illness, he was able to work again, he accepted the principalship of the Newark Union Free School. Here he first evinced a special fondness for the sciences. He created apparatus, and put in operation original methods of teaching which were peculiarly successful. As a teacher and conductor of a school he had few equals. An insight into the operations of young minds, a genius for organization, and a strong sympathy with his students, gave him a hold and influence which were phenomenal. From Newark he went to Elmira and took charge of its Free Academy. In this last school-room teaching of his life he did his most perfect work. From a state of disorder he brought the school to a degree of discipline almost ideally *perfect*. He thus describes it:

"Our large study-room, containing one hundred and sixty desks, is given up to the pupils for their own purposes. No teacher sits in it to keep order. If a pupil wishes to leave his seat, or to whisper, he does so. He is presumed to be the best judge of his own wants. Classes pass to and from the recitation rooms called by the pupils. If the teacher does not immediately appear when they assemble they commence recitation. If he fails to come at all they finish their work and return to the study-rooms. The pupils ring the bells, call and close recesses and attend to all the minutiæ of school work. If any pupil sees a pencil mark on the wall he will erase it; a piece of paper on the floor he will pick it up; anything wrong, he will stop and right it. One may often pass through the school room without attracting an eye."

Such results could not be secured except by great influence over the students, and, when secured, won for him their unbounded admiration. One of them, herself afterward a teacher, has recently written the following tribute: "When I was a school girl we were almost hero-worshipers of Professor Steele. Now that I am a mature woman, with a somewhat wider observation of schools than many have, and with a varied school experience of my own, I am better fitted for correct judgment of his ability as a teacher, and, looking through the clearer eyes of these less impassioned years, I can say with unexaggerated emphasis, that among all the able and brilliant educators I have ever known, he led the whole line in his marvellous rousing of '*esprit du corps*' among his pupils. His ideals and his wishes were to his enthusiastic pupils like those of the 'little corporal' of France to French warriors. Looking back upon the management and direction of academic affairs when I was myself a student there, I am more and more amazed (as my

comprehension becomes more perfect), at the wonderful knowledge of human nature he possessed and the skill with which he touched its springs of action. He was almost clairvoyant in his ability to read individual needs and idiosyncrasies, and a genius in providing for and directing them."

This influence over schools and pupils was the logical consequence of his own conception of his calling. He was constantly looking beyond the recitation and the lesson to the ultimate results of his work as they were to appear in mature character. This was his view:

"Each scholar has a soul, with its individual reason, will, conscience, responsibility and destiny. We are to develop that soul according to the peculiarities which God has stamped upon it, not according to any whims or notions we have formed, or any nice plans we have adopted. Souls were made before schools. We were not consulted in the matter at all. We must adapt ourselves and our systems to them. As every soul has its individuality, in dealing with each, we must weigh, and balance, and think, and pray, and strive to develop it according to the laws of its growth. I sit and, musing say to myself, 'There is a boy who is soon to go forth into life, to take up its heavy burdens, to meet its terrible temptations, perchance to shape the destiny of Church and State. I am projecting his soul out upon a path that will lift him high as Heaven or sink him deep as Hell. He is to be planted in some household where he will grow up, thrusting his roots down deep, spreading his branches out wide, sheltering, supporting, shading all round.' With this outlook, the petty questions of parsing sentences and solving problems shrink into insignificance! In the grand thought of that boy's future I catch the inspiration of the nobler motive, the higher aim and the grander truth. This one all absorbing thought looms up in my mind. *I am training an immortal soul for life.* True, he is only a poor printer's boy, but he may become a Franklin and bring down lightning from the clouds. He is only a rough sailor lad, but he may become a Columbus and discover a new world. He is only a little apple peddler, but he may accumulate a fortune and become a John Jacob Astor. He is a wretched speaker, and last week utterly broke down in his declamation, but he may become a Daniel Webster and shape the policy of the nation. How grand it would be if I could so mould and round out that boy's character as to make it uniform and consistent; if, by my exertions, the future Franklin should be a Christian philosopher, seeing God in the flashing lightning and hearing him in the rolling thunder; if the future Columbus should be mild and amiable, knowing that it is more glorious to explore, and subdue the world of passion within, than to discover and conquer a continent; if the future Webster should be frugal and temperate, feeling that he who restrains and controls his own appetite is a wiser man than he who guides the counsels of

a nation; if the future John Jacob Astor should be a benevolent, whole-souled man, making the arid desert of selfishness about him, bud and blossom like the rose, beneath the stream of his loving benefactions."

His authorship grew naturally out of his class-room work. His careful study of the laws of mental development; of the relation of imagination to thought; of memory to judgment and curiosity to diligence, suggested to him an order and form of presenting truth which fruited in his text-books. In this broader and more difficult field of teaching he attained a success which might satisfy any ambition. Book followed book in rapid succession, and the public at once approved and adopted them. They combined interest for the general reader with that natural and easy unfolding of the subject which made them so valuable in the class-room. An intelligent public, in the presence of rivalry and criticism, has rendered its verdict of approval, and that verdict is a just one. More than a million copies of his books have been sold. Beside their extended use in our own schools, I note the following remarkable facts: His chemistry has been published in raised letters as a text-book for the blind; his astronomy has been translated into Arabic and is used in the schools in Syria; and some of his books have been translated into Japanese, and are used in the schools of Japan. As a teacher, and a writer of text-books, Dr. Steele has won enduring and well-merited fame.

I have time for only a brief allusion to his personal character. He was a Christian of consistent life and evangelical faith, and did not hesitate to write books of science and history in full harmony with his religious belief. In the introduction to his physiology he uses these words, which might with equal propriety, find a place in a general introduction to all his writings: "Believing in a Divine Architect, the author cannot refrain from occasionally pointing out His inimitable workmanship and impressing the lesson of a great final cause." He loved great causes, and his whole life was a long self-denial to advance them. He cherished for years a desire to found a Professorship of Theistic Science, and though he did not live to see its accomplishment, he made provision for it in his will by a bequest of $50,000. He was one of the small minority among men who are capable of genuine and loyal friendships. True to his friends and genial to all, his social life was of the highest and most helpful character. In an editorial notice, published in "The Academy," occur these true and discriminating words:

"He was a man of singularly generous and helpful instincts, which he fostered and encouraged until they thoroughly possessed his being. It was quiet, unostentatious kindness, never heralded or highly esteemed by himself, known only to a few, but catholic in its spirit and far-reaching in its scope. It was not merely the liberal use of money where money was needed, though every year

he gave away much more than he spent himself, but he gave to every enterprise which he deemed worthy of support, constant thoughtfulness and express words of encouragement."

All in all, his life is an inspiration to every teacher and an example to every man who knew him. The record of our profession is richer and nobler because he lived and labored. Among the silent agencies which shall touch our youth and quicken them into larger and better life; which shall stimulate our teachers and encourage them to their best possibilities; and which shall pervade our school-rooms with a pure and wholesome influence, are the work and spirit of our honored fellow-laborer, J. Dorman Steele.

Dr. N. T. Clarke, of Canandaigua, said:

Mr. Chancellor.— Will you indulge me in a few brief words. I feel that I cannot let this occasion pass without giving expression to my great admiration and love of our late brother Steele and my great personal loss in his death. I call to mind very vividly as I stand here to day my first acquaintance with him. It was in this Convocation in 1865. He had just returned from the war, carrying his wounded arm in a sling. On the nomination of the late Secretary Woolworth, he was elected assistant secretary of this distinguished body. At that meeting, among others, was Professor Edward North of Hamilton College, Dr. Flack of Claverack, Dr. King of Fort Edward, Dr. Pratt of Fredonia, Principal Gardner of Whitestown, Dr. Steele and myself. For many years we came up to these annual gatherings, some of us having never missed a single meeting. To-day Dr. King and myself only are here, and the only ones left of that group save Dr. North, whose genial presence we so much miss. The others have fallen in the strength of their years and in the midst of their labors, and with a suddenness which has shocked us all.

Perhaps no member of this Convocation was better known and more beloved, especially by the academy section, than Dr. Steele. He was a true teacher of the highest type, as has been shown so clearly in the papers he has furnished to this body. With a spirit of the greatest gentleness, and a will and purpose which overcame all obstacles, he wrought a great work not only in the school-room but in the wider field of his latter years, which has made his name a household word through the length and breadth of our land.

But I cannot take your time to tell a tithe of what in my heart I feel, and can only repeat what I have already said. That I bear testimony to my great love for him as a friend, my admiration of him as a noble Christian teacher and my most profound sense of personal loss and sorrow in his death.

Of one other name on the long necrological list before us, I add a word.

Esmond V. DeGraff was many years ago a pupil of mine. He was a man of fair ability, but of wonderful enthusiasm, of systematic

habits of mind and of great energy, so that he overcame all obstacles in his work, and gave himself ultimately entirely to the institute work in which his services were sought, not only in this, but many other States, and in which he was engaged until his death.

Samuel Glasgow Armor, M. D., LL. D.

By Professor J. S. Wight, M. D., Long Island College Hospital.

Samuel Glasgow Armor was born in Washington county, Pennsylvania, January 29, 1819. His ancestors came from Scotland, and were of good stock. In 1830 he went with his parents to Holmes county, Ohio. Subsequently he entered Franklin College, New Athens, Ohio, where he remained two years. Elected contest orator of his society, he won the honor against a talented member of the senior class. In the Whig campaign of 1840 he made several speeches and edited a campaign paper. He left college and studied medicine with his brother-in-law, Dr. James S. Irvine. Soon after he was induced to study law, and was admitted to the Ohio bar in 1843. He then resumed his medical studies, and received the degree of doctor of medicine from the Missouri Medical College in 1844. He began the practice of medicine at Rockford, Illinois. The practice of medicine suited his tastes and inclinations better than that of law. In 1847 he delivered a course of lectures on physiology in the Rush Medical College, whose trustees tendered him the chair of physiology and pathology, which he declined. In 1848 he was called to the chair of physiology and pathology in the medical college at Keokuk, Iowa, where he practiced his profession. He resigned this position, and was appointed to the chair of natural sciences in the Cleveland University. In 1853 the prize offered by the Medical Society of Ohio for the best essay on a medical or surgical subject was awarded to Dr. Armor, who wrote on the "Zymotic Theory of the Essential Fevers." In the same year he resigned his chair in the Cleveland University, and was appointed to the chair of physiology and pathology in the Medical College of Ohio. In the following year he was transferred to the chair of pathology and practice of medicine and clinical medicine in this institution. In 1856 he married Miss Mary A. Holcomb, a lady of education and refinement, and settled in Dayton, Ohio, where he engaged in successful practice. He resigned his chair in the Medical College of Ohio, and was appointed to the chair of pathology and clinical medicine in the Missouri College at St. Louis. In 1862 he was appointed to the chair of Institutes of Medicine and Materia Medica in the University of Michigan at Ann Arbor, and transferred his residence to Detroit, where he

soon had a very extensive practice. In 1866 he accepted the chair of general pathology and materia medica and therapeutics in the Long Island College Hospital, and the following year was transferred to the chair of practice of medicine and clinical medicine, which he occupied till his death. In 1870 he was appointed dean of the faculty of the Long Island College Hospital. In 1872 he received the degree of LL. D. from Franklin College, Ohio. His first wife died in Brooklyn, 1878. The daughter, an only child, married Dr. Ward. In 1883 he married his second wife, a lady of culture and refinement, the widow of General Yorke, of Cincinnati, where she now resides. On the 27th day of October, 1885, Dr. Armor died. As a lecturer he stood in the first ranks; as a teacher he was equaled by few, and as a practitioner he was not surpassed. He loved his profession, because it afforded him opportunities for doing good to others. He had an affection for young men, and was pleased to direct them in the paths of duty. He had a supreme reverence for the truth in medicine, science and religion. Many noble and strong men have uttered words of praise for him who lived a life worthy of imitation. In many parts of the Union the precepts he taught young men are fructifying into good deeds. In fine, it is much praise to say of a man, when he is dead, that the world has been made better because he has lived.

Joseph Alden, D. D., LL. D., Ex-President of the New York State Normal School at Albany.

Joseph Alden, a descendant in the sixth generation of John Alden of the Mayflower, and the youngest son of Eliab and Mary Hathaway Alden, was born at Cairo, Greene Co., N. Y., on the 4th of January, 1807. He passed his childhood on his father's farm, and at an early age was sent to the district school, where he manifested the mental activity which distinguished him through life. While very young, he resolved to have a good education — to be a teacher — to become president of a college. Books were not plentiful, but he eagerly read all to which he could obtain access, frequently walking a long distance to borrow one, and reading and re-reading it until its contents became a permanent part of his mental possessions.

At the age of fourteen, he taught a district school twelve miles from Cairo, walking from his father's house to the scene of his labors. The country was sparsely settled. Many of the houses were built of logs, and the young teacher, who "boarded around," sometimes saw the stars shining through the crevices of his bedchamber. The term being ended, he walked six miles to receive his examination and certificate, and then fifteen miles through dense woods to Windham, the home of an elder brother. This

brief experience as a teacher strengthened his resolve to obtain a liberal education, and while neglecting none of his home duties, he began to fit himself for college.

In 1825 he entered Brown University, and two years later, joined the senior class in Union College, where he graduated in 1828, being the valedictorian of his class. In the autumn of the same year, he entered the Princeton Theological Seminary, and after two years of study, became tutor of geometry and Latin in Princeton College. He had already written tales, sketches and reviews for "The Rhode Island Statesman," the "New York Observer," and other papers. In 1833 he went to Philadelphia, edited the "Christian Library," and preached now and then for Dr. Gilbert Livingston, whose daughter he soon afterward married. In 1834 he became pastor of the Congregational church at Williamstown, Mass., but disease of the throat soon obliged him to resign his pastorate. In 1835 he was appointed professor of Latin, and in 1836, professor of rhetoric and political economy in Williams College. During his seventeen years connection with Williams College he was the author of many books for the young. In 1853 he was called to the chair of mental and moral science in Lafayette College, Pa., and in 1857, to the presidency of Jefferson College in the same State. Union had conferred upon him the degree of Doctor of Divinity, in 1837, and in 1857 Columbia gave him that of Doctor of Laws. After nearly six years of service, Dr. Alden resigned the presidency of Jefferson College, and sought rest and recuperation in a quiet country home in New Jersey. Even here he could not refrain from work, but gave his services as a preacher to aid in building up what is now a prosperous Presbyterian church. He also wrote a work on the "Elements of Intellectual Philosophy," one on the "Science of Government," and one on "Christian Ethics."

In 1867 he was appointed president of the New York State Normal School, at Albany, and here he spent fifteen years, saddened for him by the death of his lovely and beloved wife, but full of usefulness and inspiration to others. "He came to the school in the full vigor of his intellectual powers, and he gave to his pupils the winnowed and garnered wisdom of his past experience."

His strong, simple character impatient of shams; his conception of education as the development of mental power, the growth of character; his kind heart and ready sympathy; his enthusiasm and rare tact in teaching; together with his unfeigned and generous interest in the teachers associated with him, made his connection with the Normal School a potent and beneficent influence. It was against the protest of the executive committee that in 1882 he handed to them his resignation. But he was resolved to go before age had weakened his powers, and at the end of the school year he retired from the institution which he had served so well. Among the testimonials of respect and appreciation tendered him

at this time, none touched him more deeply than the resolutions offered by the women of the faculty, in recognition of his pronounced and liberal views in regard to the efficiency of women as teachers, and their right to a recompense paid for the work done, and not to the sex of the worker.

In addition to performing his professional duties, Dr. Alden, while in Albany, wrote many articles for newspapers and periodicals, and published several books: "The Citizens' Manual," "Hand-book for Sunday School Teachers," "Outlines of Christian Evidences," "Studies in Bryant," "First Steps in Political Economy," and "Thoughts on the Religious Life."

On leaving Albany Dr. Alden married a second time, and in 1883 went with his wife to Europe, returning the following year. He then took up his residence in New York. He continued to write for the religious press until within a few weeks of his death, and contributed many articles without his signature, saying that he wished to speak as a voice only. "It is all I can do for the Master now," he said. During the last year his physical strength declined, but his mind was as vigorous and clear as ever. His fine countenance and noble presence were not marred by age. On his serene and beautiful face rested the light of the city of God. "Seldom," said a life-long friend, "have we seen one who answered more perfectly to the ideal of a beautiful old man. As we met him in the streets or in our homes, there was in him a peculiar sweetness and gentleness that betokened his ripening for heaven." On Sunday, the 30th of August, 1885, after an illness of five days, came the summons to depart. He received it calmly, knowing in whom he had believed. He retained full possession of his faculties to the last, and passed away with a smile of joyful recognition brightening his face.

> "As if he saw dear faces, and caught the gracious eye
> Of Him, the Sinless Teacher, who came for us to die."

His life, character and influence are, to those who knew him well, a permanent and precious possession.

Frederick Norman Wright.

By Principal G. R. Cutting, Auburn, N. Y.

One year ago there was present at this Convocation a young man, one of its most interested members, then but thirty-one years of age, who had been engaged but nine years in two union schools of the State, yet who had already taken high rank among the first of our teachers and who had become a dear personal friend to a large circle of fellow-principals. In the opening days of the new year he died, and to-day, as educators and friends, we appropriately pause to pay a tribute to his memory.

Frederick Norman Wright was born at Alexander, Genesee County, N. Y., October 8, 1853. He began his preparation for college at Binghamton, completed it at the Cortland Normal School, graduated at Yale College in 1876, assumed the principalship of Jordan Union School in the same year, held it seven years till called to the principalship at Waterville Union School in September, 1883. He died of pneumonia, following typhoid fever, January 9, 1886. These simple facts do not tell the life and career of Mr. Wright as they would of many another man.

First. Fred Wright, as he was familiarly called by so many of us, was a scholar. That he stood twelfth in a class of 125 at Yale is not the proof of this. Mr. Wright was not merely a successful student, but he possessed the scholarly spirit. He was ambitious to know things thoroughly; made personal, patient, broad investigations to find them out, probing subjects to the very bottom; then, with the modesty of the true scholar and teacher, he merely inspired his pupils to follow paths that he had trodden. He was a keen observer of nature and men, a lover of scenery and travel, as elements of education. A diligent but easy and systematic worker, he knew how to rest as well as work, hence was enthusiastic in the sports of the college campus or in a vacation excursion climbing the Alps.

Second. Fred Wright was a teacher. No one ever thinks that such as he teach merely for the money received. He was a natural teacher, one born into the calling, being a scion of the Wright family, a family of teachers, so long and so favorably known in the schools of New York, the senior members of which, constant attendants at our yearly Convocations, are so highly honored by their fellow-members of this body and who are respected and loved by hosts of pupils throughout the country. In the school-room, Fred Wright was firm, quiet, gentle, clear-headed, dignified, devoted, sympathetic. He inspired pupils to think and to cultivate self-respect. He secured loyalty among scholars and subordinate teachers by compelling their respect for him. A peculiar unconscious influence for good seems to have surrounded his personality and his work. He gained the love of his pupils and the coöperation of parents and trustees by no clap-trap methods, but through himself, his sincerity, his enthusiasm, his devotion. He could discipline without threats and punish without making an enemy. He took the school at Jordan when at a low ebb and raised it to a high standard. He took the Union School at Waterville at a time of acknowledged prosperity and raised it steadily to a still higher plane. Though he died at what would seem to be, in ordinary teachers, the threshold of their careers, multitudes of pupils will multiply his virtues in their lives. "I shall be grateful," wrote a Waterville pupil, "every day of my life for the privilege of having known such a man." He loved his pupils with a true teacher's devotion. To him they were always "my boys and girls," and

their interests were his whether he was face to face with them in the class-room or whether he was carrying them in his thoughts amid his vacation rambles. Few teachers of long service have had at death as many loving tributes paid by appreciative pupils.

Third. Fred Wright was a citizen. He made himself a positive factor in the two villages in which he taught. His was that true worth which inspires respect and esteem even among those who know him only as a neighbor, a friend, a citizen.

The village of Waterville went into mourning at his death. Business was suspended and all classes, all denominations united at his funeral in paying a final tribute to his memory, though the services occurred upon one of the coldest days of the winter. This rare, universal tribute was a great credit to the cultured, appreciative village of Waterville, but a still greater credit to the teacher citizen.

Fourth. Fred Wright was a man. He was a man physically, strong, agile, well developed — the last person for whom any would prophesy an early death; his physique, his presence, especially among boys, always prepossessed in his favor. When to these we add his brilliant powers of mind and sterling soul-qualities, we may well say he was a man. Though extremely matter-of-fact in his work, yet he was a favorite in the social club of the village, and a ready, genial conversationalist in the homes and village gatherings. He had just that compound of independence of conviction and unostentatious way of putting it into practice that compels the admiration of all, while his large-hearted charity, not only for the weaker pupils inside school, but for the frailties of human nature outside the school room, won the esteem of many who were never privileged to know him, as both teacher and friend.

Fifth. Fred Wright was a Christian. He was not a man of words, nor would he ever evoke that criticism which unreflecting people sometimes give expression to, when they speak of a man as "pious." There was no dogma in his creed, no cant in his religion, no show-side to his religious life. From a youth, he was ever ready to testify for his Master, but he lived rather than talked his faith. Though distrustful of self, he had the moral courage to denounce sin in any guise. As elder successively in two Presbyterian Churches, as leader of the choir, as Sunday school teacher and superintendent, he was one of those helpful co-workers that are always the main stay of a pastor. His chum says that he was interested in Sunday school work during all his college course, and many a pupil could indorse the testimony of the Jordan pupil who says: "Mr. Wright, under the Great Father, was instrumental more than any other in bringing me to Christ." "Tell my friends that I am not afraid to die," and "don't weep for me, for I am ready," were among the last words that rounded out a life short in years, but far-reaching in influence, because through each day so thoroughly consecrated to the Christ of his early choosing.

He has gone, and yet the world needs just such men, oh how much, for one such character in a community, by the law of influence, begets many to elevate and ennoble mankind. The ranks of teachers need such, oh how much, to elevate their calling into a profession. Why should the fond and hopeful father, with whom we so deeply sympathize to-day — why should the devoted brothers and sister, why two villages; why should hundreds of pupils, this large body of fellow-teachers and the Church be called so soon to mourn one so young?

"God knows all about it. How noble,
How gentle he was, and how brave,
How brilliant his possible future,
Yet put him to sleep in the grave."

"God knew all about those who loved him,
How bitter their trial must be,
And right thro' it all God is loving,
And knows so much better than we."

"So right in the darkness be trustful,
One day you will say, 'It is well,'
God took from his young brow earth's laurels,
And crowned him with Death's immortelles."

Principal George H. Barton.

George H. Barton, late superintendent of schools in Jersey City, N. J., died at his home in that place July 10, 1885, at the age of forty-six years. He was born at New Haven, Oswego county, N. Y., July 8, 1839, and spent the early part of his life in the usual employment of farmers' boys.

When he was about fourteen years old his father died leaving a small estate which was not sufficient to provide other means of education than could be had at the district school in the neighborhood. When about eighteen, he was able to attend the academy at Mexico, N. Y., one fall term, while Professor John French, now of Syracuse University, was its principal; and during the following winter, he began teaching a district school. For three years he alternately worked on the farm, taught school and studied as he had opportunity. At the end of that time, when twenty-one years old, he determined to obtain a college education, though he had no knowledge of the classics and knew that he must earn his own living while getting his own education. He prepared for college at Falley Seminary of which Professor John Griffin, now in the office of the "Northern Christian Advocate," was principal; and in the fall of 1864 was admitted to Genesee College at Lima, N. Y.

Ill health and the necessity of teaching to procure the means of continuing his studies, forced him to remain out of college one year,

so that it was five years from the time when he was admitted, to the completion of his college course. July 8, 1869, when just thirty years of age, he was graduated at the head of his class, Miss Sara Fisher, who afterward became Mrs. Barton, receiving the second honors.

His struggles to procure an education and his ultimate success, gave him a strength of purpose, a confidence in himself and a varied experience as a teacher which enabled him to fill responsible positions as soon as he left college. He did not consider his teaching at any time merely as a stepping stone leading to some other work, but he seemed to regard his college course as the means by which he should prepare himself for higher positions in his chosen profession.

Upon leaving college Mr. Barton went at once to Rome, N. Y., to become the principal of the Rome Academy and also the superintendent of schools. He remained there three years during which time the system of graded schools was established.

In 1872 the board of education in Jersey City, N. J., was about organizing a high school, and selected Mr. Barton to be its first principal, which position he held until the death of Superintendent Wm. L. Dickinson, in November, 1883, when he was elected city superintendent, and within a short time afterwards he was chosen by the State Board of Education to be also the county superintendent. Both of these positions were held by him until his death; his memory, however, will rest chiefly upon his work in the high school, to which he gave his undivided attention for a little more than eleven years.

One who is not acquainted with the financial and educational interests of Jersey City cannot appreciate the difficulties which were encountered by the friends of education during almost the entire period from 1872 to 1883. The annexation of several adjacent cities and towns, the last of which occurred in 1870, had made Jersey City almost the largest city in the State. Each section of the city was anxious to procure for itself as many benefits as possible, and the "ring" which then controlled the city had made improvements, and issued bonds to pay for them, until the city was burdened with a load of debt from which it has never been released. The exemption of certain corporate property from local taxation, and the defective laws relating to the collection of taxes, diminished the funds at the disposal of the board of finance to such an extent that it was impossible to meet the payments of interest on the bonds and also to satisfy the requirements of the various departments of the city government. The school population was increasing with phenomenal rapidity, and there were loud calls from all parts of the city for more and better schools, especially from the annexed districts.

There was at all times a large party that opposed the establishing of a high school. Some of this party were influenced by motives

of economy, while others retained the prejudices and the conservatism of their Dutch ancestry, and thought that old-time methods and advantages were good enough. The city's financial straits furnished an occasion for this party to show its power, and more than once it seemed as if t e high school would be abolished. Chiefly through Mr. Barton's efforts every attempt was frustrated. The school was organized with about seventy pupils, and in spite of all opposition it increased, until there was an average attendance of five hundred.

Mr. Barton was especially fitted to be at the head of a large high school. To ripe scholarship was added great executive ability, and, though a strict disciplinarian, his ideas of justice, his integrity of character, his cordiality toward his pupils and his sympathy with them, enabled him to retain their warm affections. None but those who were persistently indifferent to their school duties found him a stern master. Mr. Barton did not believe in resorting frequently to corporal punishment, but he was equally opposed to abolishing it entirely, thinking, as do many others, that the possibility that a sound flogging may be given, will often prevent the occasion for it. As a disciplinarian, he excelled in establishing throughout the school a public sentiment in favor of good order, regularity in attendance, and studious deportment; but when the necessity for reproof arose he could be very severe, and not many of his pupils will ever forget the stinging words which he could address to an offender who did not heed private remonstrances. As an aid in the management of the school, a record was kept of every pupil from his entrance to his graduation. This was one of the most powerful levers connected with the school machinery. In the recitation room Mr. Barton was careful, earnest and thorough. He imparted some of his own energy to his classes; he was careful to bring the subject within the comprehension of all, and to impress the lessons upon their minds by frequent reviews. He did not believe in any cross-road to learning, nor did he expect impossibilities from his classes. It was his custom to consider the work to be done and the time that could be devoted to it, then to determine the lesson for each day during the entire term. This plan was followed with but little variation, and his classes generally accomplished the required work without any undue haste at the end.

The difficulties which he met in early life led him to sympathize with all who were surrounded by similar circumstances. He believed thoroughly in the advantages of a college education, whatever one's subsequent course might be, and he also believed that anyone with good health and an earnest purpose might enjoy those advantages He was, therefore, especially interested in those who were preparing for college, and was accustomed to draw from his own experiences in order to encourage them.

As a principal whose duty it was to supervise the work of assistant teachers, he was kind and considerate to the utmost. He

was always ready to bear the heaviest burdens and to favor his associates whenever he could. He thought that every competent teacher could best do his work in his own way, and everyone was permitted to follow his own ideas so long as the results attained were satisfactory. In this way each teacher could impress something of his own individuality upon the work of his classes, and could feel that he would himself receive credit for any improved methods which he might devise and for the results which he might attain. If, however, the occasion arose, the hand of the principal would be felt immediately, so that each one knew that while the utmost liberty of action was allowed to him, his work would be carefully examined, and that he wonld be held accountable for it.

Mr. Barton was a man who loved his profession; he believed it to be a noble one, and that no other afforded opportunities for greater influences. He enjoyed meeting his co-laborers and was accustomed to spend a portion of each summer vacation in attending the meetings of various teachers' associations. He was President of the New Jersey State Teachers' Association in 1878–79, and of the Jersey City Teachers' Association from its organization in 1879 to 1880. His election to be Superintendent of the Jersey City schools and of the schools of Hudson county gave him a wider field of action. To this work he brought the energy, good judgment and executive ability that had made him so successful as a high school principal; but the many years of hard work had begun to show their effects, and it was not long before his health became so broken as to prevent his performing his duties except with difficulty. The teachers knew that in him they had a friend fit to be trusted and competent to advise, and each one felt that his death was a personal loss.

On the 13th of July, 1885, his sorrowing friends bore his remains to their last resting place, beside those of his father, in the little cemetery near the home of his boyhood.

Principal James Gilmour.

Rev. James Gilmour died at his residence, Falley Seminary, in the village of Fulton, on Friday, December 18, 1886. It was his sixty-third birthday. As the clock struck the hour of two, his spirit took flight from its mortal frame, that had for fifteen years been struggling against the inroads of consumption, and clothed itself with robes of immortality. It was the close of a career that had been in many respects remarkable. Born of Scotch parents at Paisley, Scotland, and reared in the land of his birth, he early in life received that instruction in honesty, thoroughness and promptness which are especially characteristic of the Scottish people. He came to the United States when about nineteen years of age,

and went to Ogdensburg, N. Y., by way of the Oswego canal, passing through Fulton and Oswego while *en route.* For a few years he worked on farms, studied when he could and taught country schools. He then prepared himself for and entered Union College at Schenectady, N. Y., with only his splendid abilities as capital to carry him through. After a regular four years' course, during the presidency of the famous Dr. Nott, he graduated at Union with honor, being one of a few who received a Phi Beta Kappa Key — a distinction of high scholarship. By reason of his great industry and determination to succeed he accomplished what few have done. He entered college with very little money and when he graduated had saved nearly five hundred dollars. It was during his college course that a strong friendship rose between him and Dr. Tully of Oswego, who was a student at Union at the same time — a friendship that continued without interruption. From college he went to Europe and spent a year in travel and study. On his return to this country he entered Princeton Theological Seminary and completed the full course of theological study and was ordained as a minister of the Gospel of the Presbyterian church.

He then commenced preaching, but was obliged to give it up owing to lung difficulty. It was after this that he first entered a boarding-school as principal at Princetown, N. Y. From there he moved to Ballston Spa, where he conducted a large and important boarding-school. Twice his schools were burned to the ground by the carelessness of students. From Ballston he removed to Brooklyn, N. Y., and became engaged at that place in the lumber business. The next change was to come to Fulton some fifteen years ago, and become the head of Falley Seminary. He remained principal of this institution until the insiduous disease from which he suffered compelled him to cease his labors — two years ago. Then the school was closed.

Mr. Gilmour was a man of high attainments and a fine linguist. It was in France and Italy that he learned the French and Italian languages; besides these he was thoroughly conversant with the German and Spanish, and during his several trips abroad made it his business to study the people, their institutions, the customs and languages of these countries. His life has been one of great influence and one devoted to doing good; his character, firmness itself. For fifteen years he saw his life blood ebbing away, yet the mind never lost its vigor or faltered. The man was the same in all his varied positions from the cradle to the grave. A life of large experience, broad culture, liberal views, one that loved to see the whole human family grow better and joined in the work, has closed.

Mr. Gilmour leaves surviving him a wife, four children and three brothers, Allan Gilmour of Albany, Hon. Neil Gilmour, ex-superintendent of public instruction, and a younger brother in Scotland.

Principal Henry Arthur Smith.

In the dwelling-house of his father, B. B. Smith, in the room in which he was born, at 11.25 P. M., on Tuesday, the twenty-ninth instant, ceased the life of this young man. His birthday was June 15, 1856, and he was consequently in the thirtieth year of his age.

His preliminary education was conducted by his father and the foundation was laid broad and deep. In the fall of 1877 he entered upon a special course in Yale College in which he acquitted himself with marked distinction. September 1, 1884, he became principal of the Whitney's Point Academy, Broome county, N. Y., an institution in which, under authority and patronage of the State, young men and women are prepared for the vocation of teaching. In the middle of February following he had an attack of pneumonia, from which, however, he so far recovered in a short time as to be able to resume his duties. He came home finally in June last, but with his health hopelessly broken; but with an offer from the trustees of the school of further employment at largely increased wages.

The faculty of La Fayette College, at Easton, Pa., in 1883, without solicitation and upon examination, conferred on him the degree of A. B.

October 5, 1882, he married Miss Jennie C. Reury, daughter of Mr. Joseph H. Reury, of this place. Besides his wife he left an infant daughter.

He had excellent mental endowments. His mind was quick, alert, grasping and retentive. His method of intellectual work was methodical and thorough. For his years he had made uncommon attainments. If his life had been spared, and his health had remained good, there were large possibilities in him for a career of distinguished scholarship and usefulness.

His moral development was as rounded and symmetrical as his mental. Specially exacting as his father was in this particular, it is manifest that the moral conduct and disposition of his son, from his childhood up, never gave him a moment's uneasiness. He was a model of purity, truthfulness, integrity, industry.

Esmond V. De Graff, A. M.

By Supt. Alex. L. Wade, Morgantown, W. Va.

Having been for several years intimately associated with Professor De Graff in Peabody institute work, at the request of the widow and daughter I have prepared this brief memorial.

Esmond V. DeGraff was born in Gorham, Ontario county, New York, July 16, 1835, and died at Geneva, July 30, 1885. His early history was full of interest and heroic effort, but he rarely ever referred to it. He seemed to shrink from being seen as the struggling youth with the sweat of toil on his face, but wished to appear in public only as the mature man, the cultured gentleman, the accomplished author and educator. Though his school advantages were by no means meager, he was in an eminent sense a self-made man. His education, which commenced in the common school, was continued for two years at Canandaigua Academy, and was only completed with the ending of his life.

On leaving the academy he chose the teacher's calling, and, with the exception of two years spent in the army, pursued it to the exclusion of everything else. He began teaching in Canandaigua in 1853, took charge of the school in Middleport in 1857. and at Newark in 1861. At the close of the year he enlisted in the Thirty-third New York. Passing through the battles of Antietam, Fredericksburg and Chancellorsville, he was mustered out with the regiment May 1, 1863. Upon leaving the army he returned to the work of teaching, being first principal of the school at Fairport, and then of No. 5, Rochester. In 1867, being offered a better salary, he took charge of the school at Flushing. In 1868 he established in Rochester, "De Graff's Military and Collegiate Institute," beginning with twenty-five boys; but in the course of three years the number increased to 280, when the building was burned, and he sold the school to George D. Hale.

He began his institute work under Superintendent Rice, and while principal of the school at Green Island and city superintendent of the schools of Patterson, New Jersey, he devoted all his vacations to institute work. The work of instructing teachers seemed so well suited to his taste and he so well suited to the work and the demands for his services so increased that he resigned the superintendency of the schools of Patterson, and with tongue and pen devoted himself entirely to this work till within a few weeks of the time of his death. In speaking of him the School Bulletin says: "He has done institute work in almost every county of New York, Pennsylvania and New Jersey, as well as in Rhode Island, West Virginia, North Carolina and Maryland. His last work was done at Cumberland only a few days before his death."

Professor De Graff was an author, a musician and an orator, as well as a teacher. His books, School-room Guide, Practical Phonics, Development Lessons, Song Budget and Song Wave, are familiar to teachers, especially in the eastern and middle States. As a lecturer he was not only interesting and instructive, but often magnetic, commanding large audiences and holding them at will. He was a conscientious man and a Christian, and he always tried to do his work well. In looking over the field I find no one to take his place — no one so competent who is willing to devote himself so entirely to the institute work. I am inclined to say, as Prentice did when Webster died, using the Indian phraseology, "He has gone to the happy hunting grounds, and there is none left strong enough to bend his bow." Few men, indeed, have possessed such varied capabilities, and few have performed so much labor in so short a life. I will say of Professor De Graff what the Rev. Morley Puncheon said when that young and gifted divine, Alfred Cookman, died, "While many a man has had to toil till sundown, he finished his day's work and went home at noon."

CUBBERLEY LIBRARY

To avoid fine, this book should be returned on
or before the date last stamped below

BASEMENT

LB [redacted] C.1

Stanford University Libraries

3 6105 032 387 446

378.74
N537k
24
1886

New York university.
Proceedings of the convocation.
24th, 1886.

378.74
N537k

T YOUR NAME | SIGNATURE | DATE (STAMP)

CUBBERLEY LIBRARY